NOLOGY DEPT.

A PICTORIAL SURVEY OF CURRENT PRACTICE, EQUIPMENT AND MATERIALS

Construction Methods

C LIBRARY

JULY
1944

McGRAW-HILL PUBLISHING COMPANY, INC. • PRICE 20 CENTS

REINFORCEMENT ASSEMBLY *for deck of 3½-mi. concrete railway trestle across Mississippi River floodway is delivered to forms by traveling gantry straddling line of work.*

Machines Revolutionize Land Drainage in Britain

Sector Floodgates Built to Protect Texas Waterways

Mobile Mixers Speed Airfield Paving

A-Frame Trestle Concreted from Traveling Gantries

Truck Tire Maintenance Hints

R v.26² Jy-D1944

A TON OF FINISHED STEEL REQUIRES

ORE—2,800 LBS.

COAL—1,600 LBS.

LIMESTONE—825 LBS.

AIR—16,000 LBS.

WATER—480,000 LBS.

Some job to make a ton of steel

But America Makes Millions of Tons a Year

Have at hand—2,800 pounds of iron ore; 16,000 pounds of air; 480,000 pounds of water; 87,000 cubic feet of gas; 1,600 pounds of coal; 825 pounds of limestone; 4,300 pounds of steam; 1,500 pounds of steel scrap—also fluxes, alloys, refractories, electric power, sulphuric acid, muriatic acid, fuel oil, pitch . . . and furnaces capable of developing 27,000,000 B. t. u. for each ton of steel to be shipped.

Making a ton of steel is complex in method and equipment, as well as in the number, and quality of ingredients, supplies and utilities.

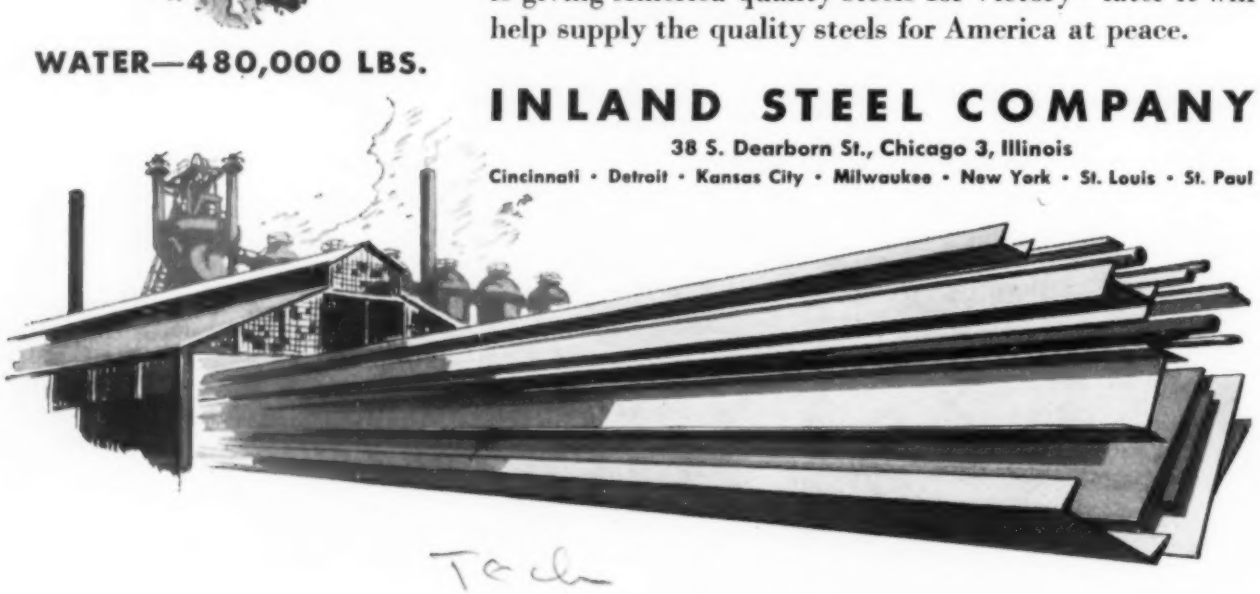
At Inland these complex processes are controlled by a large staff of metallurgists working in laboratories and in the plants, and by specially trained engineers who constantly investigate and design new mechanical methods and equipment. Basic ingredients—ore, limestone, coal and fluorspar—come from Inland owned mines and quarries—selected and blended to meet the needs of critical steelmakers. All other supplies are obtained under rigid specifications.

The Inland "know how" for making each ton of steel is giving America quality steels for Victory—later it will help supply the quality steels for America at peace.

INLAND STEEL COMPANY

38 S. Dearborn St., Chicago 3, Illinois

Cincinnati • Detroit • Kansas City • Milwaukee • New York • St. Louis • St. Paul



Tech

CURRENT JOBS

. . . and Who's Doing Them

BUILDINGS

Public—Navy contract for $2,452,445 detention units and barracks at Shoemaker, Calif., was awarded to **A. Farnell Blair,** of San Francisco. Another Navy contract for construction at Coronado, Calif., amphibious training base went to **I. C. Curry & F. E. Young,** of San Diego, for $1,934,000. Low bidder on $1,629,000 Navy contract at Philadelphia, Pa., is **Turner Construction Co.,** of New York, N. Y. **Jeffress-Dyer, Inc.,** of Washington, D. C., submitted low bid of $1,499,963 for Waves barracks at Arlington, Va. **William P. Neil Co.,** of Los Angeles, Calif., has $1,468,703 Navy contract for buildings at Seal Beach. Navy storehouses at San Diego, Calif., will be built by **Ford J. Twaits Co.,** of Los Angeles, for $1,451,175. **Wm. M. Moore Building Corp.,** of New York, N. Y., has $1,399,050 contract for hospital facilities at Canandaigua. Contract for $1,250,000 plant addition at Decatur, Ala., was awarded to **Rust Engineering Co.,** of Birmingham. **Goerig, Phelps & Strand,** of Seattle, Wash., has $957,560 contract for buildings at Renton, Wash. **R. P. Farnsworth & Co., Inc.,** of New Orleans, La., will build housing units at New Orleans for $914,817. **A. Janin & Co., Ltd.,** of Montreal, Que., has $1,000,000 contract for storage buildings at Longue Point.

Industrial—Power plant at Terre Haute, Ind., will be built for $5,000,000 by **Gust K. Newberg Construction Co.,** of Chicago, Ill.

Commercial—Dwellings at San Pedro, Calif., will be built by **Brittian Construction Co.,** of Los Angeles, for $1,250,000. Contract for 240 houses at Lake Ridge, Wash., was awarded to **Nettleton & Baldwin,** of Seattle, for $1,250,000. **Evans & Inman,** of New Orleans, La., has $1,000,000 housing contract. **Development Engineers, Inc.,** of Los Angeles, Calif., will build $1,000,000 dwellings at Lynwood, and another group of houses for $1,000,000 at West Los Angeles and Santa Monica.

HEAVY CONSTRUCTION

Army contract for piling, deck and riprap at Alameda, Calif., went to **Stolte, Inc.,** of Oakland and **Duncanson-Harrelson Co.,** of San Francisco, for $5,810,127. Runway extension fill at Army airport in San Francisco will be built by **Macco Construction Co.,** of Oakland and **Morrison-Knudsen Construction Co.,** of San Francisco, for $2,013,000. Contract for dam on Verde River, Phoenix, Ariz., was awarded to **L. E. Dixon Co.,** of Los Angeles, Calif., for $1,659,000. Naval air station facilities in Virginia and North Carolina will be built by **Grannis, Thompson, Street & Wattinger,** of Richmond, for $1,391,000. Two pipeline contracts in California were awarded to **Pacific Pipe Line Construction Co.,** of Los Angeles, for $519,000 and $573,000. **Crown Paving & Construction Co., Ltd.,** of Edmonton, Alta., has $1,500,000 contract for airport runway. Runways at Grand Prairie, Alta., airport will be built by **Western Construction & Lumber Co.,** of Edmonton, for $1,000,000. MacDonald Construction Co., of St. Louis, Mo., has $1,060,000 contract for refuse incinerators in Honolulu, T. H.

HIGHWAYS

Among recent highway contract awards are the following: California: $952,158 to **Peter Kiewit Sons Co.,** of Omaha, Neb.; $517,500 to **Stolte, Inc.,** of Oakland; and $240,429 to **J. R. Reeves,** of Sacramento. Indiana: $239,109 to **Bontrager Construction Co.,** of Elkhart; and $211,256 to **Calumet Paving Co.,** of Indianapolis. Maryland: $200,071 to **E. Stewart Mitchell,** of Baltimore. Minnesota: $266,570 to **Ashworth-Hawkinson Co.,** of St. Louis, Mo. North Carolina: $316,813 to **R. C. Huffman Construction Co.,** of Norfolk, Va. Pennsylvania: $917,910 to **Union Building & Construction Corp.,** of Passaic, N. J.; and $717,378 to **Buffalo Gravel Corp.,** of Camp Hill. Virginia: $383,638 to **Sam Finley, Inc.,** of Roanoke; and $271,951 to **Bero Engineering & Construction Corp.,** of Richmond.

Copyright, 1944 — Established 1919

McGraw-Hill Publishing Co., Inc., 330 West 42nd St., New York (18)

Construction Methods

A Pictorial Survey of Current Practice, Equipment and Materials

JOHN ABBINK, Publisher

ROBERT K. TOMLIN, Editor — A. E. PAXTON, Manager

Editorial Staff: Vincent B. Smith, Paul Wooton (Washington) N. A. Bowers (San Francisco) Nelle Fitzgerald Patricia McGerr

JULY, 1944

THE *How* OF IT

For the benefit of readers concerned with the practical application of method or equipment the following references are to articles or illustrations in this issue that tell:

How **JUNGLE STREAM** was bridged by Army Engineers in South Pacific. —p. 55

How **TRENCHING MACHINES** marked new era in land drainage in Britain. —p. 58

How **MOLE DRAINAGE SYSTEM** was used in England's heavy clay areas. —p. 60

How **BATTERY OF MOBILE MIXERS** speeded concrete paving of Army airfield. —p. 62

How **TANK TRAILER** drawn by paver was equipped with pump to furnish mixing water. —p. 63

How **SECTOR FLOODGATES** were built to stop silting of navigation canal. —p. 66

How **LONG A-FRAME TRESTLE** was concreted from mobile overhead plant straddling line of work. —p. 70

How **TIMBER BLIMP DOCK ARCHES** were erected from traveler to set speed record. —p. 72

How **TWO-WAY COMMUNICATION SYSTEM** was used by foreman of crew on traveler to give orders to power shovel operator. —p. 73

How **SURGE CHAMBER** for tunnel was built from top, down. —p. 76

How **PREVENTIVE MAINTENANCE** keeps small contractor's equipment in service. —p .77

How **PHOTOS AID OPERATORS** in demonstrating right and wrong methods of wire rope use. —p. 78

How **MOBILE JOB-MADE BRIDGE** mounted on rollers provided working platform for erectors and painters of pumping station. —p. 80

How **SIX-TON ANCHOR** hung on rear of crane served as counterweight to prevent overturning in lifting heavy loads. —p. 80

How **POWER-OPERATED SAWS** were used to fell trees in southern pulpwood operations. —p. 81

How **TWO WOOD-POLE EXTENSIONS** increased length of boom on truck-crane to erect tall structural steel towers. —p. 81

How **TRUCK TIRES** should be mounted and dismounted, removed and remounted to insure maximum mileage. —p. 82

How **JOINTED PIPE** was pushed into place across swamp by bulldozer blade on tractor. —p. 84

McGRAW-HILL PUBLISHING COMPANY, INC., 330 WEST 42d STREET, NEW YORK (18), N. Y.

JAMES H. McGRAW, Founder and Honorary Chairman

Editorial and Publishing Offices: 330 West 42nd St., New York (18); 520 North Michigan Ave., Chicago (11); 68 Post St., San Francisco (4); 738-9 Oliver Bldg., Pittsburgh; Aldwych House, London, W. C. 2, England. Branch Offices: Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Los Angeles; Atlanta, Ga.

JAMES H. McGRAW, JR., President — **HOWARD EHRLICH**, Executive Vice-President for Business Operations — **JOHN ABBINK**, Executive Vice-President for Editorial Operations

CURTIS W. McGRAW, Vice-President and Treasurer — **JOSEPH A. GERARDI**, Secretary — **I. E. BLACKBURN**, Circulation Manager

CONSTRUCTION METHODS, July, 1944. Volume 26. Number 7. Published Monthly, price 20¢ a copy. **Return Postage Guaranteed.** Allow at least ten days for change of address. All communications about subscriptions should be addressed to the Director of Circulation, 330 West 42nd Street, New York (18), N. Y. **Subscription rates**—United States, Mexico and Central and South American countries, $1.00 a year, $1.50 for two years, $2.00 for three years. Canada, $1.50 a year, $2.50 for two years, $3.00 for three years. Great Britain and British Possessions, 12 shillings a year, 36 shillings for three years. All other countries, $2.00 a year, $6.00 for three years. Entered (or reentered) as second class matter December 16, 1936, at the Post Office of New York, N. Y., U. S. A., under the act of March 3rd, 1879. Printed in U. S. A. Cable address: "McGrawhill, New York." Member of A. B. P. Member of A. B. C.

Contents copyrighted 1944 by McGraw-Hill Publishing Co., Inc., 330 West 42nd Street, New York (18), N. Y.

CHANGE OF ADDRESS

McGRAW-HILL PUBLISHING COMPANY
330 West 42nd Street, New York (18), N. Y.

Director of Circulation:

Please change my address on Construction Methods

From .....

.....

To .....

.....

Signed .....

FREE ENTERPRISE

The Obligation of Management and Labor to Cooperate...in War...in Peace

The Invasion is on! We have unleashed our full might for military victory. We have confidence that our great strength will bring success. We are strong because we have achieved unity in mobilization and in combat.

Though victory appears assured, we cannot rest until we have done everything in our power to speed the day when death and destruction are halted.

The home front is an important factor in this time element, for the fighting power of our Armed Forces depends upon their weapons. Napoleon's army fought "on its stomach"—man against man. Eisenhower's men fight on their tonnage—tanks, artillery, machine guns, heavy bombers.

As never before in the long succession of wars, the legends of heroic deeds on the battlefronts in this world conflict will be paralleled in history by the great accomplishments on the production fronts. Along with these heroic achievements of our Armed Forces, the world will long remember the record of our production accomplishments which have made us the strongest military power in the world, as well as the arsenal of democracy.

As the conflict reaches its climax, as battles grow fiercer and more destructive, our responsibility becomes greater and more critical. We must coordinate our productive efforts with the same ingenuity and the same precision with which our Armed Forces have coordinated theirs. We dare not waste the productivity of a single man or machine in these critical days.

As our landing craft are discharging men on the beaches of Europe and the Pacific, they must not want for equipment. No interference with war production for any reason can be justified. There must be no picket lines in America!

The landing of American troops in France virtually has stopped all strikes in the United States. This is important and encouraging news because the prelude to Invasion, unfortunately, has been an epidemic of strikes. Time lost through strikes, during the first four months of 1944, was double that lost during the same period last year. April saw more strikes than any other month since Pearl Harbor, and in May the record again was broken. Here is what happened within two weeks in May:

> Nine thousand men in six Chrysler plants in Detroit were out when a jurisdictional dispute in a "soda pop" war between the American Federation of Labor teamsters and the Congress of Industrial Organizations fired their discontent.
>
> A three-day sit-down strike occurred among 950 employees in the B. H. Aircraft plant over the refusal of the company to discharge a superintendent unsatisfactory to the union.
>
> Thirteen hundred men in the Chevrolet transmission and axle plant at Saginaw struck over a no-smoking rule and a change in shift-starting time.
>
> Two thousand employees at the Brown and Sharpe Manufacturing Company walked out when a woman was hired to fill a job long held by a man.
>
> Production of penicillin, blood plasma, and other medical supplies was halted at two Detroit plants of the Parke Davis Company as 1900 employees struck for a ten-cent raise.
>
> Over 25,000 lumber workers in the Pacific Northwest struck because the War Labor Board denied their demand for a wage increase.

At the end of the third week of May, 70,000 workers in 26 plants in Detroit were idle because of strikes.

Strikes in Detroit alone reduced production as much as a moderately successful German air raid would have done. Far more important than their effect on output is the effect of strikes upon national unity and morale. To our home front and to our Armed Forces, strikes belie our pledge to back the attack with all the power at our command. Hence, strikes limit our all-out war effort.

Prompt and decisive action is needed to keep America free from strikes for the remainder of the war. Stoppages of work on the production lines cannot be condoned while lives are being lost in fighting the enemy.

Most union leaders realize this need and are preparing to impose discipline upon their members who violate the no-strike pledge. The Warehouse Division of the International Longshoremen's and Warehousemen's Union (C.I.O.) recently declared: "Strikes in this time of war are treason against the nation and betrayal of the interests of labor." A message sent by William Green to all heads of American Federation of Labor unions stated:

> "D-day is here. From now on until Hitler is finally crushed, every worker enrolled in the army of production must consider himself a part of the invasion forces of the United States and conduct himself accordingly. I call on you in the name of the American boys who are risking their lives under enemy fire to maintain uninterrupted production under any and all circumstances. Until victory is won every worker must give the same all-out service that our Armed Forces are giving on the field of battle."

Strongest of all was the appeal of R. J. Thomas, president of the United Automobile Workers, to members of his union:

> "Our union cannot survive if the nation and our soldiers believe that we are obstructing the war effort . . . there can be no such thing as legitimate picket lines . . . I appeal to our membership. If you value your union, if you want to live and serve after the war, we must restrain ourselves and our hot-headed brothers today. If we do not, there will be no union after the war."

Union officers are entitled to vigorous support from management and government in their efforts to prevent strikes. Behind many a strike is an accumulation of unsettled grievances. Managements are overworked, and many union shop stewards are new and inexperienced and do not always do their part in turning down cases which lack merit. Both of these conditions make it easy for large backlogs of unsettled grievances to pile up. A special drive to clean up unsettled cases and to prevent new accumulations of them is one way by which managements and local union officials can help shorten the war.

The government too has a contribution to make to the prevention of strikes—both through the prompt disposal of disputes and through firm action against the leaders of strikes. The National War Labor Board and the Regional Boards are disposing of over five thousand cases a month and have made an excellent record in reducing their backlogs. Nevertheless, the boards still have many old cases; and about one out of four strikes has been an effort to get action from one of the labor boards. The boards are entitled to cooperation from employers and unions in keeping down their docket. In instance after instance, cases are dumped in the lap of the board before the union and employer have made a real effort to get a meeting of minds and to work out settlements.

In the present emergency, strikes are an expression of the lack of adequate understanding and team work between unions and management. Any future great upsurge in industrial strife likewise will be due to misunderstanding. After this war this country must not go through another "1919" when the time lost from strikes reached an all-time high. With 13 million workers, or almost half of the non-salaried employees of the country, in trade unions, the power and prestige of unions is greater than ever. *The long-run prosperity of the country requires that business and labor learn how to cooperate in supporting the policies which produce the largest possible profits and the largest possible payrolls.*

Although business is primarily interested in the largest possible profits, and labor is primarily interested in the largest possible payrolls, both objectives call for the same basic conditions. Payrolls depend upon the prospects for profits. If bad relations between business and labor or unwise public policies cause employers to take a pessimistic view of the outlook for profits, both employment and payrolls will be depressed.

Individual unions and individual employers always will have differences over wages and hours and the status of labor in particular plants or in particular occupations. Some disputes on such issues are inevitable, but resort to arbitration and calm intelligence can help greatly in avoiding strikes in the long run. Cooperation between labor and management is an economic necessity. In our kind of economy, payrolls and profits *both depend upon the willingness and the ability of business and labor to work together in creating the conditions under which enterprise flourishes.*

The foundation for intelligent and effective cooperation must be accomplished by skillful and imaginative managers in plants throughout the country who are willing to help unions with their problems, and who are able to interest union leaders and their members in the problems of business. Union members and their leaders are keenly interested as a rule in the efforts of management to win new markets. They know that jobs depend upon the success of managements in improving the product, adding new items to the line, and, less frequently, cutting costs and prices. Employees like to be kept informed about what management is doing, what problems it is meeting, and what success it is having. Most of all, they like to have an opportunity to contribute their ideas and suggestions.

The recent epidemic of strikes should not blind us to the fact that even today there are more plants where managements and unions are on good terms than ever before in the country's history. Consider, on the one hand, the extensive and constantly growing efforts of unions to train and develop shop stewards and, on the other hand, the efforts of employers to teach foremen how to carry out the new responsibilities imposed upon them by union agreements. Unions and managements together are learning how to operate together such technical devices as time study and job evaluation. Managements which, several years ago, opposed the provision of umpires to interpret union agreements and to settle deadlocked cases today are taking the lead in suggesting such arrangements.

The war is reaching a crisis, and all groups in the country must be aware as never before of their common interests. This presents an opportunity which should be seized to lay the permanent foundations for more effective team work in American industry. Let history record that the days when Europe was being liberated also were the days when unions and employers were making unprecedented progress in preparing American industry for the return of the service men by developing policies of cooperation between business and unions. Such cooperation will help achieve a peace worthy of our efforts and our sacrifies.

President, McGraw-Hill Publishing Company, Inc.

"COMBINED OPERATIONS"

CAREFULLY planned "combined operations" win battles; the same principle whips concreting problems. Advance planning saves time and money. Lone Star Cement and 'Incor' 24-Hour Cement dovetail to produce maximum construction economies. For each job, estimate which cement produces the lowest concreting cost . . . forms, time and cement all considered. Where overnight stripping strength shows a net saving, use 'Incor'*; for other parts of the structure, use Lone Star Cement. That's selective concreting . . . and it saves time and money!

*Reg. U. S. Pat. Off.

PLAN IT

FOR QUALITY, SPEED, ECONOMY

Estimate each job with BOTH of these high-quality Cements . . . results since 1927 prove 'Incor' advantages on—

STRUCTURES — 24-hour form removal . . . 50% less forms . . . no reposting.

HEAVY-DUTY FLOORS — overnight service, greater wear-resistance.

WATERTIGHT CONCRETE — one-day curing . . . dense and durable.

WINTER WORK — saves heating, tarps, forms.

LONE STAR CEMENT CORPORATION

Offices: ALBANY • BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS • JACKSON, MISS.
KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK • PHILADELPHIA • ST. LOUIS • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25-MILLION BARRELS ANNUAL CAPACITY

IN THE high tide of invasion, east and west, thousands of International Diesel Tractors are serving the Army, the Navy, the Marine Corps, and the Air Forces. On many a battle-front these tractors play a fighting part in the drama of tanks and ships and fighting men.

Take Guadalcanal. In the tense hours of that first invasion it was *do or die* on the airstrip. International Diesels went ashore with their bull-dozers . . . filled in craters as fast as enemy bombs dug them . . . did combat duty to help the Marines cling to the toehold that gave us Henderson Field. Many a tractor operator died there, under fire, but the great Pacific Offensive was on.

It is the year of decision—overseas and over here. This year many thousands of tractor operators on the home front will come to close grips with the warning: *Take care of that equipment! Make it last! Make it do!* Harvester and the International Industrial Power Distributors stand ready to see you through. If your need for new equipment is vital to the war effort, we will have equipment for you. If your need is less vital, we will safeguard your present International Power with every service aid at our command.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue Chicago 1, Illinois

Fight with your blood—Give to the Blood Bank
Fight with your money—Buy EXTRA Bonds
Fight on the food front—Stay with that War Garden
Fight the hidden enemy—Fight INFLATION!

INTERNATIONAL HARVESTER
Power for Victory

NO Compromise HERE!

Rear-Dump and Bottom-Dump EUCLIDS are designed and built for a single purpose — to move earth, rock, coal, ore and other materials on off-the-highway hauls with speed and economy. Planetary type full-floating drive axle, greater flotation and tractive power, and heavy construction throughout . . . all of these features make Euclid equipment outstanding for dependable performance and lower hauling costs.

Because they are built exclusively for hauling large loads on difficult hauls, there is no compromise in the design or the construction of Euclids. Weight is kept to a minimum consistent with large capacity and long life on tough jobs. Hundreds of earth moving contractors, and industrial owners too, have proved conclusively that Euclids cost less to own and operate on both long and short hauls.

The EUCLID ROAD MACHINERY Co. · · · Cleveland 17, Ohio

EUCLID SELF-POWERED HAULING EQUIPMENT For EARTH ROCK COAL ORE

For superior

lifting power

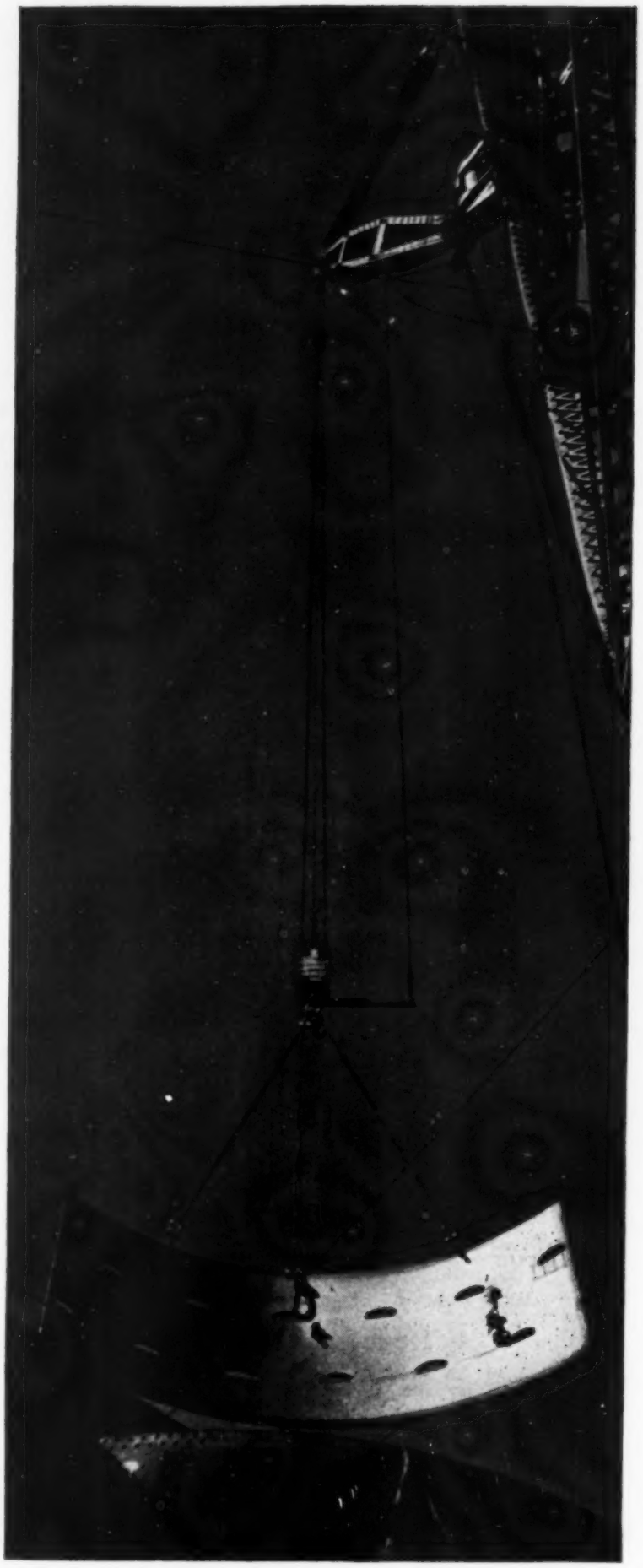
PURPLE STRAND WIRE ROPE

Superior lifting power—and plenty of reserve strength—is what's needed in construction jobs like this one, where giant cranes waft tons of steel through the air.

Lifting power is what Purple Strand has in abundance. This top-quality Bethlehem wire rope is the product of more than fifty years' experience in wire-rope manufacture. It is manufactured under close metallurgical control from blast furnace to stranding machine.

"Purple Strand" means that the rope is made of Improved Plow Steel—the huskiest steel used in any wire rope. For greatest durability and ease of handling, specify not only Purple Strand but "Form-Set"—which means that the wire rope is preformed rope, given its helical shape both in the individual wires and in the strands. Unlike ordinary rope, whose wires contain pent-up stresses and are possessed with a permanent urge to straighten themselves out, preformed rope is stable and relaxed, more resistant to bending fatigue, and much easier to spool and handle.

Make a note to order Form-Set Purple Strand Rope. But order it, please, as far in advance as possible, so that you'll be sure to have it when you need it.



★ ★ ★ BETHLEHEM STEEL ★ ★ ★

MODERN MATERIAL MOVERS...

to save you time and money!

Left, an Athey MobiLoader loads from stockpile into truck in Alabama. Force-Feed Loader at right picks up and loads material on road widening job in Maryland.

Manpower is today's big problem. Men are scarce and time-saving equipment comes more and more into popularity. Athey loading equipment is stepping up loading production with less manpower, thus, it's filling a vital wartime need.

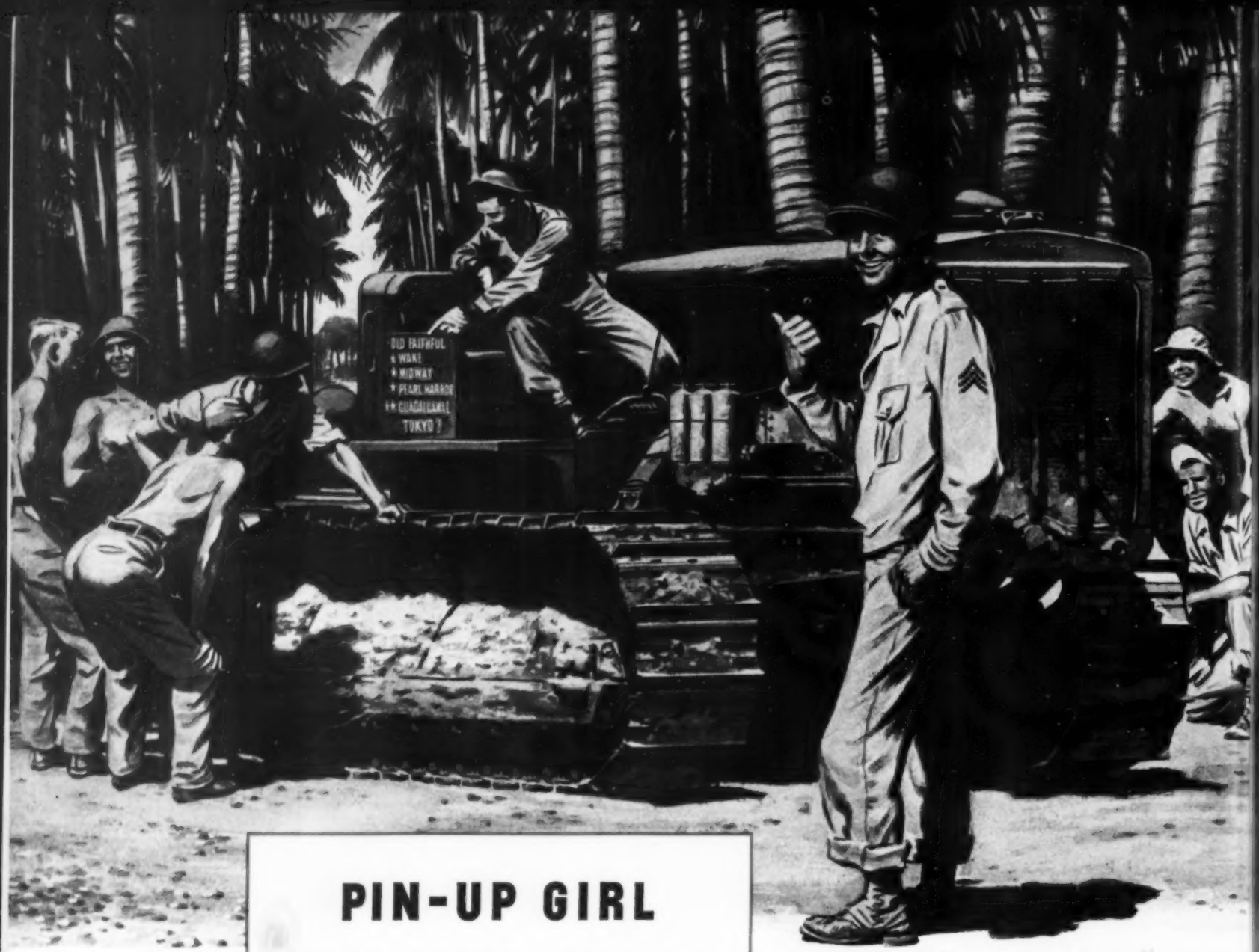
The Athey MobiLoader cuts minutes from loading time because it backs up and unloads material overhead, saves tractor turning. Keeps costs low, too, through the economy of the "Caterpillar" Diesel Tractor. It handles the widest variety of materials.

The self-propelled Athey Force-Feed Loader is another man and time saver. It's a companion tool for the Motor Grader. Loads surplus materials, cheaper, faster and cleaner than ever before. Works on highway maintenance and construction.

Why not check further into these modern loading machines? Write your Athey-"Caterpillar" Dealer, or direct to Athey Truss Wheel Co., 5631 W. 65th Street, Chicago, 38, Ill.

Athey

. . . for Hauling and Loading Equipment



Painted from an actual photograph taken on Guadalcanal

PIN-UP GIRL OF GUADALCANAL

THEY call her "Old Faithful"— as true a sweetheart as ever endeared herself to fighting men in all history. No slim and shapely beauty, she holds a treasured spot in the hearts of thousands of U. S. Marines and Navy Seabees.

She was on duty at Wake Island when the war began. She's seen wartime service on Midway and done her share in the repairs to Pearl Harbor. Then off to Guadalcanal she went, to toil and labor in the steaming heat of the jungles. And beneath the campaign stars which she so proudly wears is emblazoned the word "Tokyo," so there's no telling how far her adventures may carry her.

Silly, you say, to speak that way of a "Caterpillar" Diesel Tractor? Just ask any service man who has fought on the battlefields around the world! You'll discover a genuine, deep-rooted affection for these rugged machines . . . an affection inspired by the brawny power and tireless dependability that fighting men admire.

They've gone side by side with our troops in the face of death . . . landed on beachheads and helped to hold them . . . hauled precious supplies to places of safety . . . hewed out airfields . . . helped build roads and bridges . . . demolished enemy pillboxes. With bulldozer blades raised, they've even spearheaded infantry attacks on machine-gun nests. And when landing barges laden with wounded have refused to budge, they've waded deep into the surf to nudge them off into the sea and on their way.

Already the history of this war is filled with tales of heroic men and the faithful "bulldozers" that have given them the priceless advantage of "workpower." When you read one of these "'dozer" stories, you can be pretty sure it refers to a "Caterpillar" Diesel Tractor, whether it was equipped with a bulldozer blade or not.

And it's not only "Caterpillar" Diesel Tractors that are winning their laurels. Doing a thousand and more jobs on the fighting fronts, "Caterpillar" Diesel Motor Graders, Engines and Electric Sets are earning their service stripes in every branch of the armed forces.

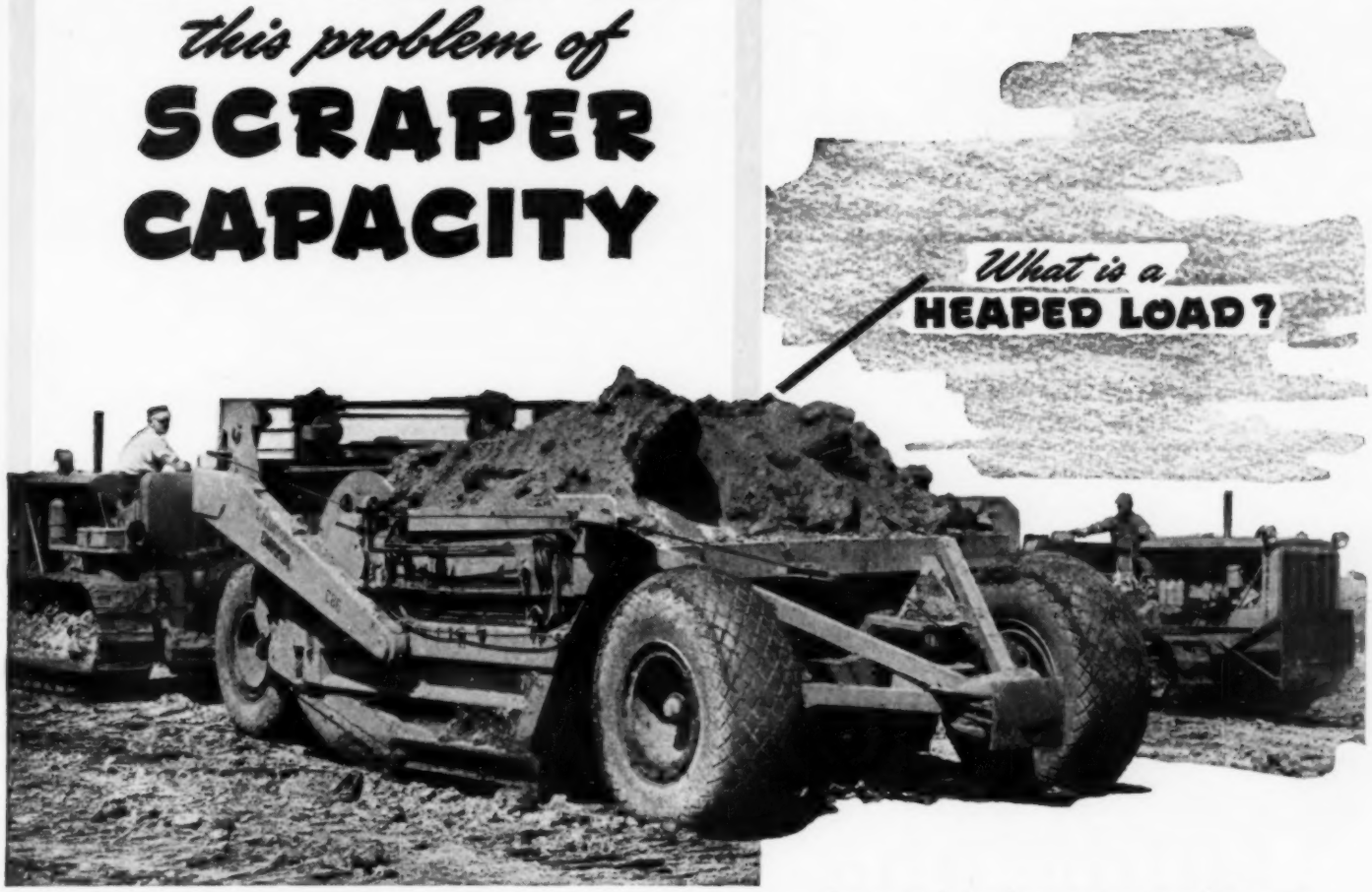
CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

CATERPILLAR DIESEL

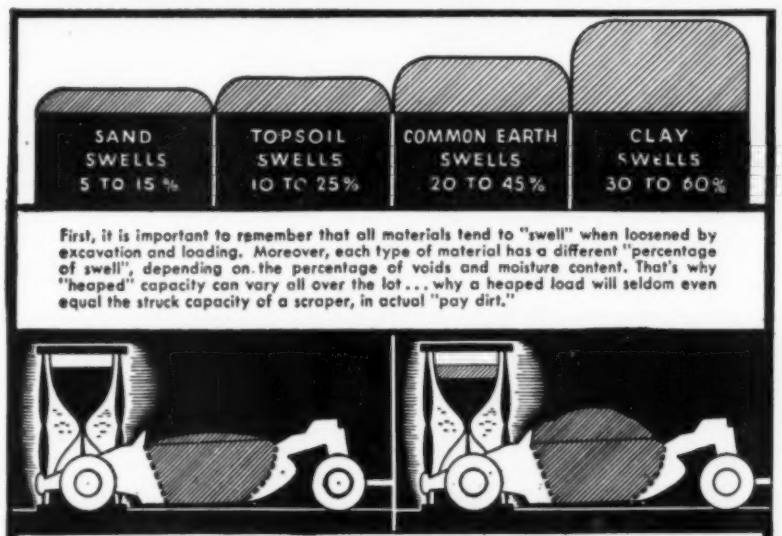
REG. U.S. PAT. OFF.

TO WIN THE WAR: WORK—FIGHT—BUY MORE WAR BONDS!

LET'S ANALYZE *this problem of* SCRAPER CAPACITY



TWO REASONS WHY "HEAPED" CAPACITY IS MISLEADING



First, it is important to remember that all materials tend to "swell" when loosened by excavation and loading. Moreover, each type of material has a different "percentage of swell", depending on the percentage of voids and moisture content. That's why "heaped" capacity can vary all over the lot . . . why a heaped load will seldom even equal the struck capacity of a scraper, in actual "pay dirt."

On short hauls and poor loading material, it usually doesn't pay to waste time getting a full "heaped" load because it may take you practically as long to load the last quarter as it did the first three-quarters—regardless of whose scraper you use. In other words, on short haul jobs, you'll be time and money ahead if you can avoid spending too much of your total time cycle in loading.

LaPLANT-CHOATE

Earthmoving and Land Clearing Equipment

For years, it has been common practice among various scraper manufacturers to talk about "pay dirt" in the same breath with "*heaped*" capacity. Yet as every experienced dirt mover knows, figures on "heaped" capacity can be very misleading because *all classes of material tend to heap differently when loaded into a scraper.* Moreover, on many jobs, it doesn't pay to load "the last yard" because too much of the total time cycle may be consumed in loading—even with the help of a pusher.

Struck Capacity Safer!

For these reasons, LaPlant-Choate engineers have consistently maintained that the only logical way to estimate scraper yardage is on the basis of *struck* capacity—using the exact volume of the scraper bowl. Even then, the wise dirt mover usually deducts a certain percentage for "swell". However, by using *struck* capacity, you at least have a safer, more accurate figure to start with because "heaped" capacity is always an "unknown quantity." That's why it always pays to find out *which figure* a manufacturer is using, before accepting any claims regarding "yardage moved." For further information, see your LaPlant-Choate "Caterpillar" distributor, or write, LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa.

Monotubes

—the First Word in Foundations
—the Last Word in Speed . . . .

WHEN you plan the construction of buildings, bridges, airports, highway overpasses—plan on Monotubes for cast-in-place concrete piling. Their tapered, fluted construction permits speed with safety. Their tubular design permits quick, sure inspection prior to concreting. Their "easily extendible" feature permits the economical installation of varying pile lengths. And their lightness (despite remarkable strength) permits driving with average job equipment. Available in a gauge, size, and taper to meet all requirements. Catalog 68A gives full details. Write The Union Metal Manufacturing Company, Canton 5, Ohio.

UNION METAL

Monotube Tapered Piles

From steel making to rope laying...we never forget this fact...that pound for pound, wire rope has more bearing surface than any other piece of equipment. That's why you can depend on...

WHAT can you expect from Roebling? Rope that has known capacity to deliver service. Engineering, in our plant and at your job, to put the rope to work right. Maintenance practices that protect its long life. Your postwar profits and postwar jobs will depend in part on operating rope-rigged equipment at lowest cost. You can leave that part to Roebling.

JOHN A. ROEBLING'S SONS COMPANY

TRENTON 2, NEW JERSEY

Branches and Warehouses in Principal Cities

Wire Rope and Strand • Fittings • Cold Rolled Strip • Aircord, Swaged Terminals and Assemblies • Round and Shaped Wire Wire Cloth and Netting • High and Low Carbon Acid, and Basic Open Hearth Steels Suspension Bridges and Cables • Electrical Wires and Cables • Aerial Wire Rope Systems

ROEBLING

PACEMAKER IN WIRE PRODUCTS

LORAINS

ARE IN THE THICK OF IT *everywhere!*

In London, Lorain Moto-Cranes clear away wreckage after the London "Blitz".

In the South Pacific, a Lorain Crane salvages a wrecked Jap destroyer.

In Italy, a Lorain scoops up debris from a bombed building to clear the way for the advance.

In the Aleutians, when it isn't snowing or freezing, Lorains have mud conditions such as this to contend with.

THE Turnpike, Radio City, the Alcan, Big Inch, the Pan American Highway and scores of other big-time jobs . . . Lorains are veterans of them all. But never have Lorains tackled jobs as big, as important, or as tough as those you'll find them working on, at the fighting fronts the world over.

Right now, these jobs in Italy, the Aleutians, in Britain and the South Pacific are full-time operations for Lorains, but there are other big jobs coming up; the postwar program of equally important, necessary, at-home jobs.

Lorains will again be available for whatever material handling job that comes your way, but with this essential difference; because of their wartime experiences, improvements and developments, Lorains will be equipped even better, to serve you profitably.

You'll be wise in starting to find out about these better Lorains by getting in touch with the Lorain Distributor in your territory right now. He has the facts, the experience and the facilities to serve you well and wisely in planning your postwar equipment setup.

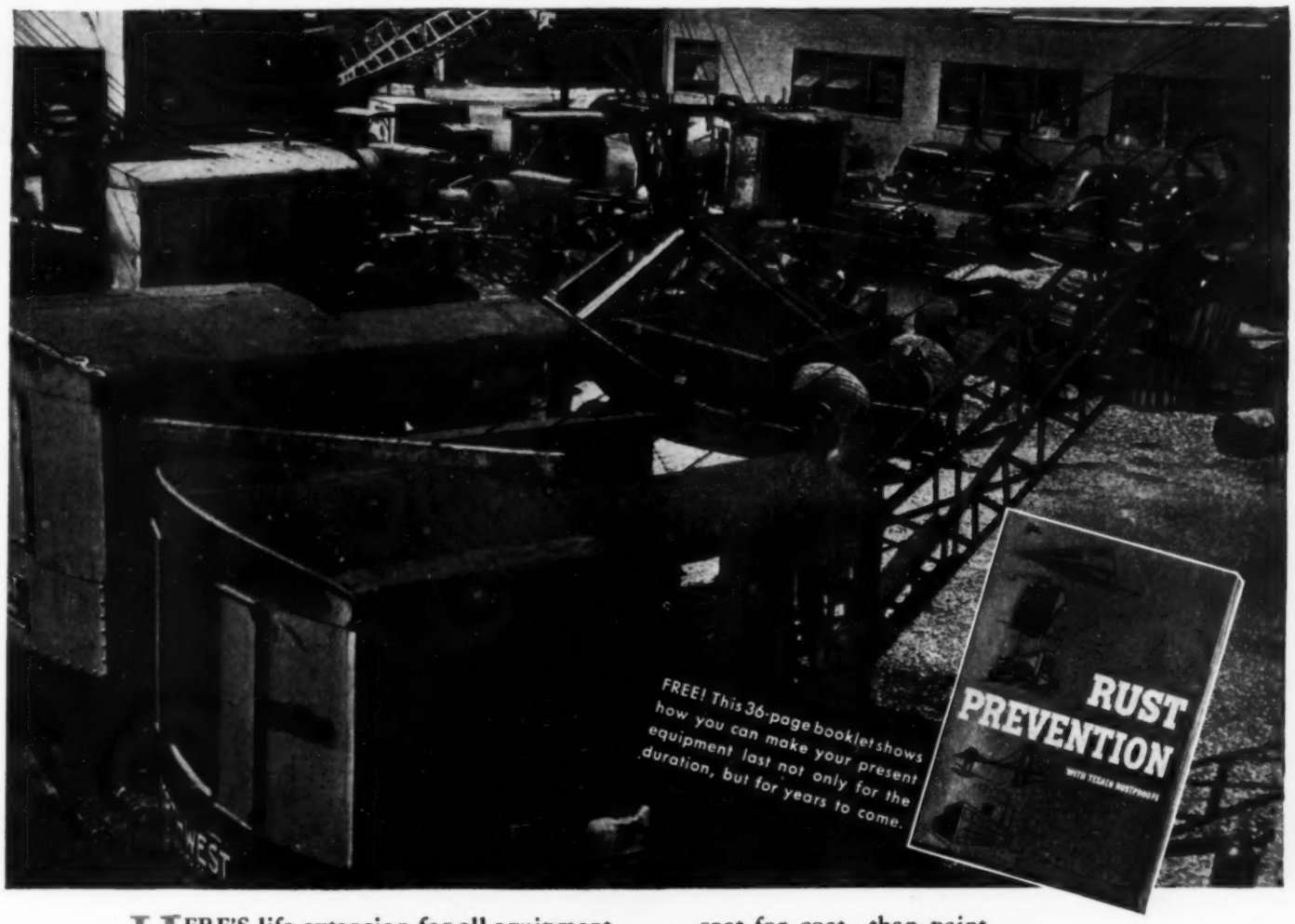
THE THEW SHOVEL COMPANY • Lorain, Ohio

Reg. Trade Mark

thew-Lorain

CRANES • SHOVELS • DRAGLINES • MOTO-CRANES

NEW LOW-COST PROTECTION AGAINST RUST


FREE! This 36-page booklet shows how you can make your present equipment last not only for the duration, but for years to come.
RUST PREVENTION
WITH TEXACO RUSTPROOFS

HERE'S life extension for all equipment used by contractors, waterworks and sewage disposal plants . . . shovels, graders, concrete mixers and forms, screening plants, steel pipes, tanks, etc. . . . all metal exposed to corrosion, in use or in storage.

Texaco Rustproof Compound provides a penetrating, self-sealing film that is not only waterproof but highly resistant to chemicals and fumes. In many cases, costly chipping of existing rust and scale is eliminated. *Texaco Rustproof Compound* does not dry out, but remains soft, healing over any scratches and abrasions. It is much more economical —coat for coat—than paint.

Texaco Rustproof Compound has proven highly successful on leading railroads which have used millions of pounds for protection against the weather, salt brine drippings, flue gases, etc.

Write for free booklet entitled "Rust Prevention." It tells *how Texaco Rustproof* prevents rust, *where* and *how* to apply it and why it is so successful. Every industrial executive and engineer should have a copy. A single suggestion in this booklet may save thousands of dollars. The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Rustproof Compound

TUNE IN THE TEXACO STAR THEATRE EVERY SUNDAY NIGHT—CBS ★ HELP WIN THE WAR BY RETURNING EMPTY DRUMS PROMPTLY

You wouldn't

put splints on a TOE DANCER

LAY·SET *Preformed* IS FREE

The preforming process frees **LAY-SET** Wire Rope of muscle-bound stresses. Being preformed, Hazard **LAY-SET** is not hampered by needless strains. Rather, every wire and strand is free to do its full share of work from the very first hour it is put on your machine.

Hazard **LAY-SET** Preformed is a "pre-broken-in" rope; it resists snarling and kinking; it handles easier, faster, safer and cheaper. It possesses high resistance to bending fatigue and so lasts longer —much longer than non-preformed wire rope. Regardless of where or how you use wire rope, whether for running or standing service, specify Hazard **LAY-SET** Preformed—the rope that gives you greater dollar value.

Hazard **LAY-SET** Preformed Wire Rope is "in the service" on countless jobs for the Armed Forces where it is proving its many advantages. Specify it for *your* use.

HAZARD WIRE ROPE DIVISION • Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC. • BRIDGEPORT • CONN.

HAZARD LAY·SET *Preformed* WIRE ROPE

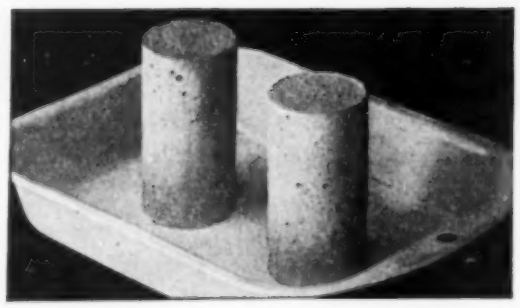
DETROIT PUBLIC LIBRARY

BRIXMENT *Mortar is More Durable*

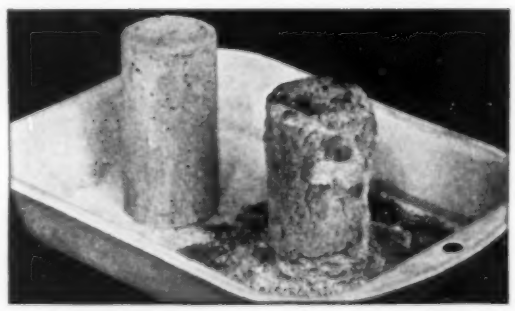
● FOR permanent strength and beauty, mortar must be *durable*—must be able to withstand the alternate freezing and thawing to which it is subjected many times each winter.

Brixment mortar *is more durable.* This greater durability is due partly to the strength and soundness of Brixment mortar, and partly to the fact that Brixment is waterproofed during manufacture. This waterproofing helps prevent the mortar from becoming saturated—therefore protects it from the destructive action of freezing and thawing.

Walls built with Brixment mortar therefore *retain* their original strength and appearance. . . . Even in parapet walls and chimneys, where exposure is particularly severe, Brixment mortar will almost never require re-pointing.



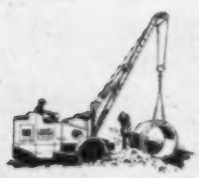
These two photographs show a cylinder of Brixment mortar (left) and a cylinder made with 50-50 cement and lime mortar (right). Both specimens were made at the same time, and subjected to exactly the same treatment.



After curing for 30 days, ¼" of water was put into the tray and the cylinders were alternately frozen and thawed 15 times. Note that the Brixment mortar remains intact, whereas the other mortar has crumbled badly.

LOUISVILLE CEMENT COMPANY, Incorporated
General Offices: Louisville 2, Kentucky
Cement Manufacturers Since 1830

Your turn is coming when Jaeger will supply you with the smoothest running 2-stage, air-cooled compressors you've ever operated . . . Built to aircraft engine precision standards in a balanced "W" design, with "Tough Swedish Twin" Valves for air plus coolness, full force-feed lubrication and large reserves of power, they are efficient in performance, accessible and long-lived in every part . . . Please be patient until Uncle Sam's needs have been supplied . . . THE JAEGER MACHINE COMPANY, Columbus 16, Ohio.


"FLEET-FOOT" Crane-Loaders

"SPEEDLINE" Concrete Mixers

"SURE PRIME" Contractors Pumps

JAEGER *Engineered* EQUIPMENT

JAEGER-LAKEWOOD SPREADERS, FINISHERS AND BITUMINOUS PAVERS, FORMS, FORM TAMPERS—"DUAL-MIX" TRUCK MIXERS, AGITATORS—JAEGER HOISTING ENGINES, TOWERS

TIMKEN

EASY POWER SHIFT

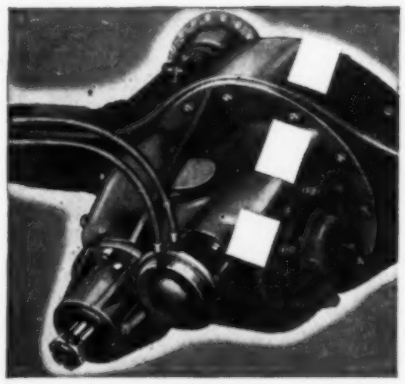
THE KEY to easy shifting with TIMKEN 2-SPEED AXLES

Timken's new Easy POWER Shift, available only with new Timken 2-Speed Double Reduction Axles, enables truck operators to meet today's highway transport demands for capacity loads and fast schedules.

Axle ratios can be changed instantly, under any driving conditions, merely by using the Dash Selector and releasing the foot throttle momentarily. Declutching is not necessary. Combined axle and transmission shifts (gear splits) can be made as easily as transmission shifts alone.

Doubling the number of transmission ratios, with any gear combination instantly available, greatly increases truck performance—results in faster schedules, greater economy and increased earnings per ton-mile, and with less driver fatigue.

Write for descriptive folder.



Power for shifting axle gears is furnished by a vacuum power chamber built into the axle. All working parts are enclosed.

38 YEARS OF AXLE ENGINEERING LEADERSHIP

TIMKEN AXLES

THE TIMKEN-DETROIT AXLE COMPANY, DETROIT 32, MICHIGAN
WISCONSIN AXLE DIVISION • OSHKOSH, WISCONSIN

FIFTEEN NORTHWESTS

for

PETER KIEWIT

Sons' Company

Omaha, Nebraska

Here's one of those dirt jobs we've been talking about—and here's one of the many well known contractors that gets things done and buys Northwests again and again for results, because he knows that if you have a real Rock Shovel, you are equipped for output in any kind of digging.

Fifteen Northwests—fourteen repeat orders is a lot of testimonial to service, particularly when that service includes practically every type of work from the ordinary road job to the Iron Range.

Concerns like Peter Kiewit Sons don't make mistakes in buying machinery, and a shovel that will make money for them will make money for you.

NORTHWEST ENGINEERING CO., 1728 Steger Bldg., 28 E. Jackson Blvd., Chicago 4, Ill.

—When you have a real Rock Shove the output in dirt is always high!

HIGH-SPEED *TOURNAPULLS* SAVE

INDUSTRIAL PLANT FROM RISING FLOOD WATERS

Fast-moving Tournapulls throw-up emergency levee t keep Illinois River water from stopping war productio at R. G. LeTourneau, Inc., Peoria Plant. River raise 12 feet above average stage. Notice depth of wate Railroad tracks remain dry — shipments can continu

Build 3,000 Feet of Levee, an Average of 5 Feet High and 20 Feet Wide in 489 Machine Hours

The ability of rubber-tired Tournapulls to haul dirt fast over paved city streets and wet, rutted haul roads enabled R. G. LeTourneau, Inc. to fight the Illinois River to a standstill during a recent flood threat. These powerful dirtmovers hauled 9846 cu. yds. of clay and loam over an 8,000-foot one-way haul in 489 machine hours . . . kept the emergency levee at an average of 2 feet above the rapidly raising waters.

Without Tournapulls, this emergency dirtmoving job would have been impossible. The haul route included: city streets, four railroad crossings, a state highway, grades from 3 to 10%—and a considerable section of the soft top of the emergency levee.

Rubber-Tired Power the Answer

The large pneumatic tires on the Tournapulls not only allowed travel over paved surfaces but also gave ample flotation on the almost impassable levee roads—same time aided compaction on the levee. Plenty of excess power and rimpull for Tournapull weight permitted top speeds up to 14.9 m.p.h. on parts of the haul . . . also enabled the rigs to handle the adverse grades and to pull through the muddy spots.

COMPARE WITH OTHER METHODS

Problem: To move 9,846 cu. yds. over 8,000-foot one-way haul for emergency levee.

EQUIPMENT	Tournapulls Model Super C with 11-Yard Carryall	Tractors 90 H.P. Model with 11-Yard Scraper	Shovel 1¾-Yard Model 18—4-Yard Trucks
MACHINE HOURS REQUIRED	Actual Performance	Estimated Performance	Estimated Performance
	489	1315	608

NOTE: Performance based on 40 minute hour or 66⅔% efficiency because of delays on haul route waiting for traffic at state highway, trains at railroad crossings and normal traffic flow of trucks and trains from shipping department.

High-speed, rubber-tired Tournapulls built this 3,000-foot levee in 45.5 hours with an average use of 11 rigs. With tractor-drawn equipment it would have taken 29 units to do the same job in an equal amount of time. The truck and shovel time could not be improved by adding units as 18 is the maximum for cycle loading on 8,000-foot one-way haul.

Ask About TOURNAPULLS for Your Jobs

For lowest-cost postwar earthmoving, plan to use the rubber-tired power of Tournapulls. More than 1,800 are now in use. For detailed information on Tournapulls, write TODAY for the new 8-page informative booklet — "The Trend to Rubber-Tired Power". Address: R. G. LeTourneau, Inc., Dept. CEM 644, Peoria, Illinois.

LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

▼ Large Tournapull and Carryall tires made hauling over paved streets possible. On 16,000-foot round trip, Tournapulls turned 10 corners, crossed 4 railroad tracks and a state highway.

▼ Tournapulls were required to end-dump on one part of the levee. These earthmovers had plenty of power and maneuverability to back over the 9 loose yards. This eliminated much Dozer work; dirt could be placed near end of narrow levee.

▼ 275 feet of sandbag levee connects two sections of the dirt levee. Over 8,000 man hours were used to build this sandbag section — only 700 man hours for the 3,000-foot dirt levee.

TOURNAPULLS RUBBER-TIRED POWER FOR FASTER EARTHMOVING

QUICK QUIZ FOR CONSTRUCTION MEN

One of these Answers May Make You a Fortune!

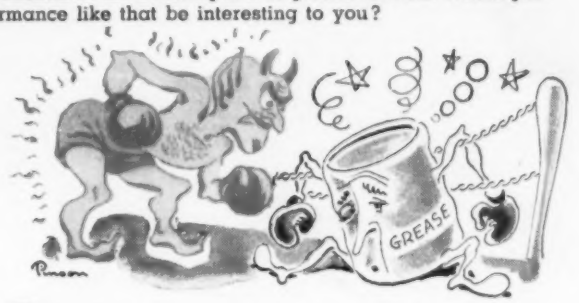
Q Can you put "M.P.T."* into your machines?

A Chances are you can, just as this contractor did. He suspected his lubrication methods were too slow and were costing him production. He consulted with an Alemite Lubrication Specialist who recommended a faster, more accurate and efficient "on the job" method. Now, the contractor lubricates track roller bearings in 2½ seconds. Fills transmission and final drive at the rate of 14 pounds per minute. How do these lubrication times compare with yours?

**More Productive Time*

Q Having an epidemic of track roller failures?

A If the answer is "Yes," here's how one outfit cured their trouble. Alemite Lubrication Specialists recommended an "on the job" method of pressure lubrication. In the first 18 months, a check-up revealed that track roller wear had been reduced almost 1/3 over old hand-type greasing. The method also produced a 19% reduction in the consumption of grease and oil. Would performance like that be interesting to you?



Q Summer heat knocked the "fight" out of your lubricants?

A Not if they're Alemite greases and oils. Here's why: Alemite builds an extra-wide operating range into every grease and oil. They have the toughness, the resistance to heat and pressures that keep them in there fighting friction no matter the summer temperatures. Alemite #33, in addition to heat-resisting qualities, is extremely water-repellent, endures tremendous loads, can't clog grease guns or bearing lubricant grooves.

Can "LUBRI-*chaos*" Rob You of Money, Machines and Production?

It surely can. And "Lubri-*chaos*" is found in the most modern construction set-ups. Today, with wartime schedules of production, "Lubri-*chaos*" has shown how it really can cut into plant efficiency.

Alemite, as pioneer in the handling, distribution and application of lubricants has long crusaded against "Lubri-*chaos*." As a result, the modern Alemite methods are now recognized as the answer to "Lubri-*chaos*" by scores of construction and engineering companies all over America.

The Alemite method of lubrication will play an important role in boosting peacetime operations to meet competition. Why not consult with Alemite Lubrication Specialists about readying your machines now to gain the competitive advantages of the world's most modern lubricating methods? There's no obligation. Alemite, 1840 Diversey Parkway, Chicago 14, Illinois, or Belleville, Ontario.

WANTED
Tough Job by Man with "MML" Degree!

This man, an Alemite Lubrication Specialist, is a "Master of Modern Lubrication." His technical training, skill and experience equip him to come on your job and consult with you about applying the most modern lubricating methods. He has added more productive time to machines, saved lubricants and man power. He has installed safer, surer, more accurate lubricating methods.

He's ready to go to work for you now, backed by the world's most experienced organization in the handling and application of lubricants. Call him. Or, if you prefer, write, wire or phone Alemite for his address.

Another Product of STEWART WARNER

ALEMITE

First in Modern Lubrication

CONSULTATION • ENGINEERING • EQUIPMENT • LUBRICANTS • MAINTENANCE

The tire that carries its own insurance

A typical example of B. F. Goodrich development in rubber

BRUISE breaks caused by a tire hitting a stone, rock, or other sharp object are a common cause of off-the-road tire failure. Many small bruises are undetected, yet they cause cords in the fabric to break. Then the break enlarges, plies separate, and eventually the tire blows out.

To provide added protection against bruise and impact breaks B. F. Goodrich engineers developed a special construction. There are four cord breakers directly under the treads, insulated with thick layers of special shock-resisting rubber. Under impact the cords stretch and return to their original positions, distributing the force of the blow and allowing it to be absorbed by the rubber between them. Thus the shock passed on to the carcass of the tire is greatly reduced. This provides far greater resistance to bruising and to ply separation.

The tire shown above, the Universal, has many other advantages. The tread is non-directional, with equal traction forwards or backwards. Rocks cannot cut or snag the tread so easily because there are fewer sharp edges and corners. And special tread compounds are used to further resist cutting. The angular grooves of the tread design prevent side slippage.

Because of special B. F. Goodrich features the Universal and other tires in the off-the-road line are today giving exceptional service on all types of jobs. Supplies of all truck tires are now strictly limited, so it is well to place tentative orders early. When you need new tires, repairs, or recapping, see the B. F. Goodrich dealer. *The B. F. Goodrich Co., Akron, O.*

60 foot washboard for butadiene gas

Shown here is a stripper-scrubber, a busy piece of refinery equipment that strips off butadiene gases and then scrubs out impurities—a vital operation in the manufacture of synthetic rubber.

This particular vessel is the largest one of its kind ever built. Although it towers some 60 feet, its steel shell is but one-half an inch thick—a meticulous fabrication job and one logically assigned to the craftsmen of Consolidated Steel Corporation.

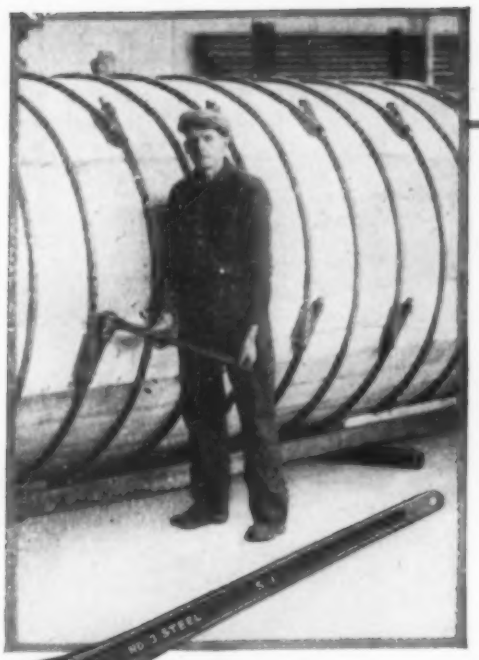
Precision work quickly accomplished—today it is continuing to win for the men and women of Consolidated Steel every basic government industrial award, tomorrow it will be devoted to the construction needs of a peacetime America. Inquiries looking to future construction are solicited. Address the president.

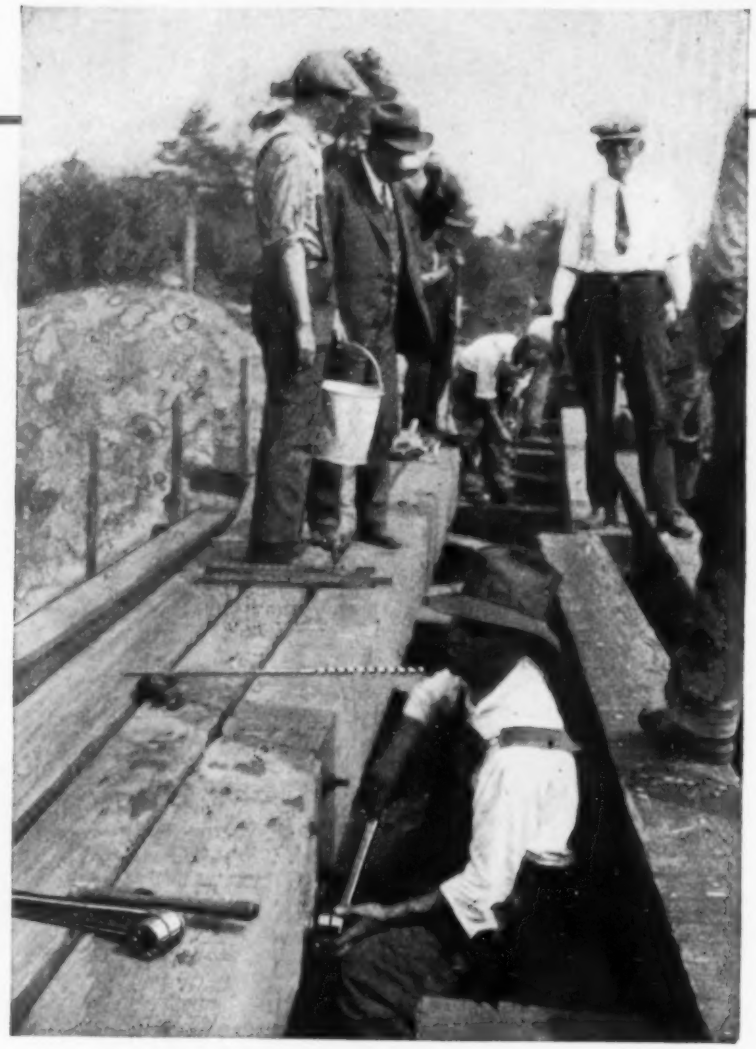
Consolidated Steel

FABRICATORS
ENGINEERS
CRAFTSMEN

LARGEST INDEPENDENT IN THE WEST

CONSOLIDATED STEEL CORP., LTD., LOS ANGELES
LONG BEACH, WILMINGTON, CALIF.; ORANGE, TEX.

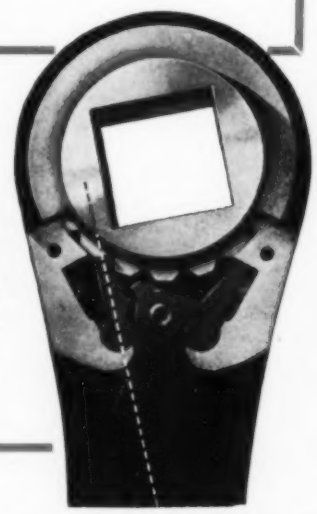




WHETHER the job involves bolting up timber stringers, or banding a woodstave pipe—you are likely to find LOWELL Red Ratchet Wrenches entrusted with the work. Their safety, speed and adaptability to a wide range of construction, are recognized by contractors everywhere. Sold through leading distributors.

Straight line LEVERAGE..

See how each pawl, when engaged, transmits leverage from the solid stock of the handle, direct to the gear, in a straight line and with a square contact. The pawl is in *compression only*—no shear, no tension, no torsion. The shipper carries none of the load. This strong construction insures steady service.



75 Years Serving the Heavy Construction Industry

LOWELL WRENCH COMPANY

1869 WORCESTER 8, MASS., U.S.A. 1944

The Heart of good "CABLE OPERATION"

. . . is in the flexibility, power and dependability of the Cable Power Unit. That's why years of experience have built into Isaacson units the background of successful operation. Brake and clutch fighting has been eliminated, adjustments once made, hold longer. Operator fatigue has given way to increased efficiency. Integral strength is built into the case. It's sealed against lubrication leakage. There are no splines to wear, stick or cause misalignment. Relining is simple and takes but a few minutes—no bearing adjustment required. Smooth, positive longwearing controls. Just a few of the improvements, job-proven, in your Isaacson Kable Power Unit. See your dealer for specifications before you buy.

Kable Power Unit shown installed on Isaacson Kable-Dozer. This complete unit is available to suit your tractor. Front-mounted power unit is also available. Put your problem up to our engineers for recommendations. No obligation.

ISAACSON
Iron Works
SEATTLE
ENGINEERED TRACTOR EQUIPMENT

American
MATERIALS HANDLING FOR EVERY INDUSTRY

AN AMERICAN DERRICK *for* EVERY DERRICK JOB

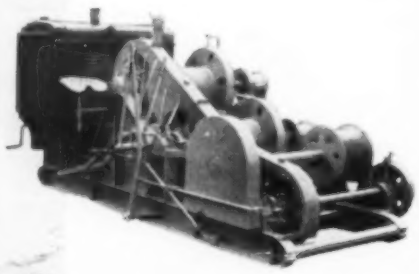
And there are a lot of derrick jobs in materials handling on construction work, but there is an AMERICAN Steel Derrick for every one of them. In the Guy, Stiffleg, Steel Erectors', and special types, there is a choice in size, length of boom, and lifting capacity that offers a versatility in derrick application.

How up-to-date are your materials handling methods for the big construction work ahead? Now is the time to plan on improving them. Catalog D-1 tells all about the AMERICAN Derricks.

• • •

Other AMERICAN Materials Handling Methods for construction work

AMERICAN Locomotive Crane at aggregate plant.



AMERICAN General Purpose Hoist.

AMERICAN REVOLVER in dam construction.

4434

Plan now . . . but wait for **AMERICAN!**

AMERICAN MATERIALS HANDLING *for* EVERY INDUSTRY

AMERICAN HOIST & DERRICK CO.

Saint Paul 1, Minnesota

CHICAGO SAN FRANCISCO NEW YORK

Wherever wire rope is fastened . . . . use genuine **CROSBY CLIPS** *with the Red-U-Bolt*

There's Nothing Finer than SKILSAW!

IT WAS FIRST IN 1923

Photograph of the first SKILSAW...the ORIGINAL portable electric saw.

AND IT'S THE BEST IN 1944!

More SKILSAWS are in use today than the total of all other makes of portable electric saws!

● It's no wonder that SKILSAW is *the most popular saw* among contractors everywhere. SKILSAW is better built, more efficient, more dependable. Every SKILSAW made is the product of constant effort to improve everything that goes into it—materials, craftsmanship and design.

Ever since 1923, SKILSAW has helped contractors do a *better* job of building. Before the War, SKILSAW speeded the construction of thousands of homes, industrial plants and factories. Since Pearl Harbor, SKILSAW has helped build vital war plants, barracks, airdromes, war housing projects, *even faster.*

SKILSAW is the most valuable time-saving and labor-saving tool you can have! It makes every cut in construction *quicker* . . . makes every worker count for more! Ask your distributor to demonstrate SKILSAW *today!*

★ ★ ★

Look to SKILSAW for continued leadership! When private building returns . . . new, lighter weight and more efficient SKILSAWS will be ready to speed up all of your sawing . . . to make more profit for you on every construction job.

SKILSAW, INC.
5033-43 Elston Ave., Chicago 30, Ill.
Sales and Service Branches in All Principal Cities

SKILSAW PORTABLE ELECTRIC TOOLS
MAKE AMERICA'S HANDS MORE PRODUCTIVE

FOR Balanced Performance

LET THE Red Strand BE Your GUIDE

★ PREFORMED or Non-Preformed . . . Round Strand or Flattened Strand . . . hemp center or wire rope center . . . whatever your needs, there is a "HERCULES" (Red-Strand) Wire Rope that will give you longer service.

That is because the five essentials — strength . . . elasticity . . . flexibility . . . toughness . . . durability are built into "HERCULES" (Red-Strand) Wire Rope in perfect balance.

For balanced wire rope performance you can rely on "HERCULES". For real wire rope economy, let the RED-STRAND be your guide.

"HERCULES" (RED-STRAND) Round Strand WIRE ROPE 1886

"HERCULES" (RED-STRAND) Flattened Strand WIRE ROPE 1893

"HERCULES" (RED-STRAND) Preformed WIRE ROPE 1934

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

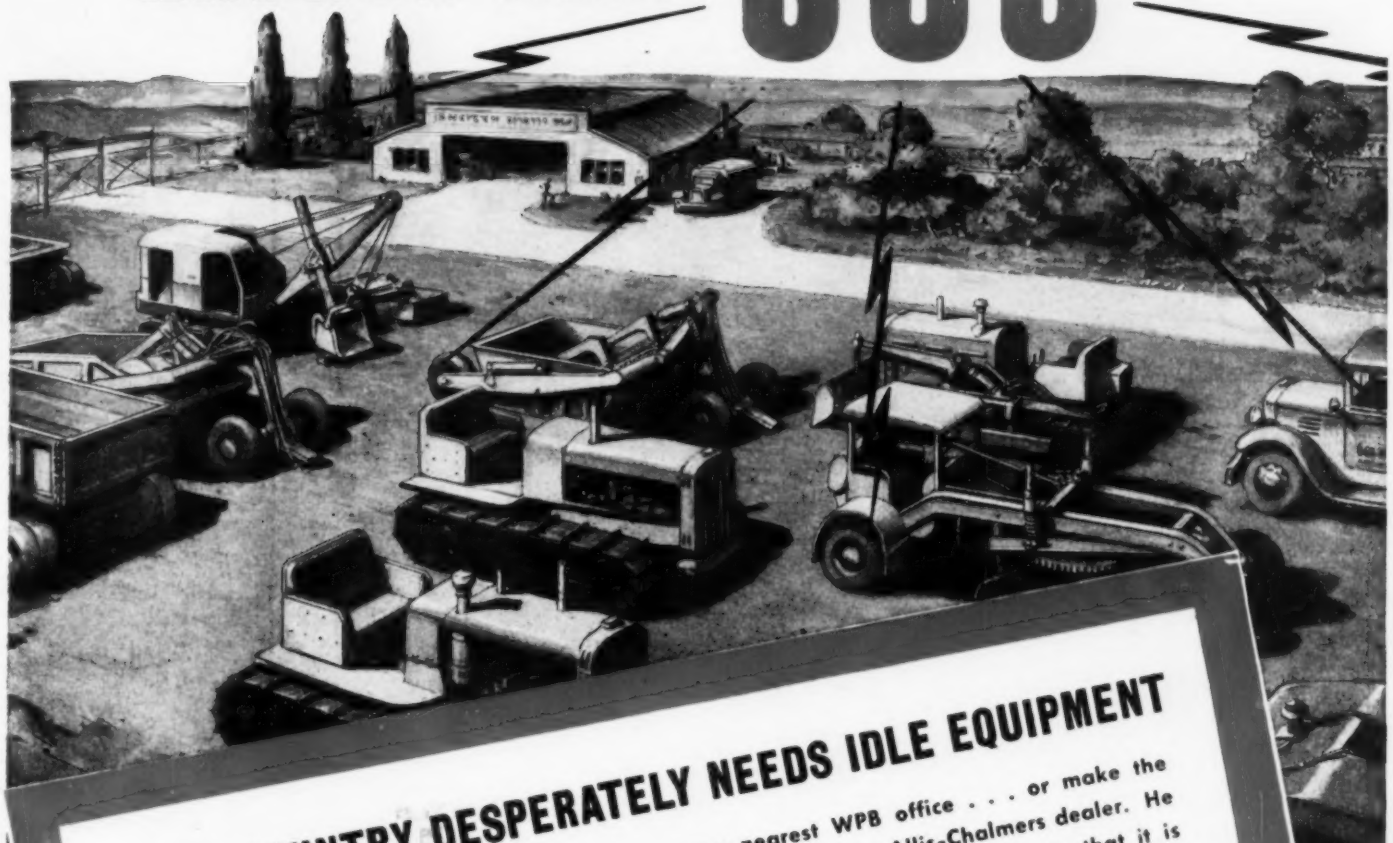
WIRE ROPE MAKERS — ESTABLISHED 1857

5909 KENNERLY AVENUE — ST. LOUIS, MISSOURI, U. S. A.

NEW YORK . . . 90 West Street
CHICAGO . . 810 W. Washington Blvd.
DENVER . . . 1554 Wazee Street

SAN FRANCISCO . . 520 Fourth Street
PORTLAND . . 914 N. W. 14th Avenue
SEATTLE . . 3410 First Avenue South

ANSWER THIS SOS



YOUR COUNTRY DESPERATELY NEEDS IDLE EQUIPMENT

Even with the greatly expanded construction equipment industry producing FOUR TIMES its pre-war rate . . . there is still a serious shortage of construction equipment. Nearly all new machines go directly to our armed forces overseas, even a large number of used outfits. As military operations expand, and additional territory is reclaimed from the Axis, more and more will be needed. Besides this — vital industries are in desperate need of tractors, graders, shovels, cranes and other units.

Here is a chance to actively support the war effort — rent or sell idle machines to essential users. Apply for authorization at your nearest WPB office . . . or make the deal through your Allis-Chalmers dealer. He will buy your equipment and see that it is directed into war work. No authorization is required on sales to dealers.

"Your equipment was not built to become a monument of idleness. It was built to do a job. Its use is constructive and every effort should be made to see that the maximum amount of good comes from its existence on the home front at this time. We cannot afford the luxury of idle equipment stored away and waiting for peacetime work".*

*H. M. Hale, Director of WPB Construction Machinery Division, Equipment Bureau.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

TAX RELIEF!

Special tax relief benefits are obtained on the gain from the sale of used construction equipment. Get all the facts from your Collector of Internal Revenue.

• • •

★ Buy War Bonds
★ Save Waste Paper
★ Turn In Scrap Metal
★ Be A Blood Donor
★ Pay Only Ceiling Prices

HOW AIRFIELDS GROW ON MUCK, ON SAND, ON TUNDRA

ON world-wide battle fronts America's planes are taking off on missions against the enemy—taking off from desert sand, jungle muck, or Aleutian tundra.

In a matter of days, bulldozers shove aside the muck or level the sand. And giant cranes lay steel landing mats that are bolted into a landing strip.

Look at the engines in these bulldozers and cranes. You'll find familiar friends—the same friends that power tanks and trucks, landing barges and patrol vessels, tractors and auxiliaries—General Motors Diesels.

And in these rigorous jobs of war, a promise is being written—a promise of plentiful, dependable, easily maintained, low-cost power for America's needs in the peacetime days ahead.

Tomorrow

Reconstruction and new construction are going to need plenty of this hard-hitting, easy-on-the-fuel power. With normal refinement and development speeded up by war, with production expanded, GM Diesels will be ready to serve in more fields and in more ways than ever.

GM
GENERAL MOTORS
DIESEL POWER

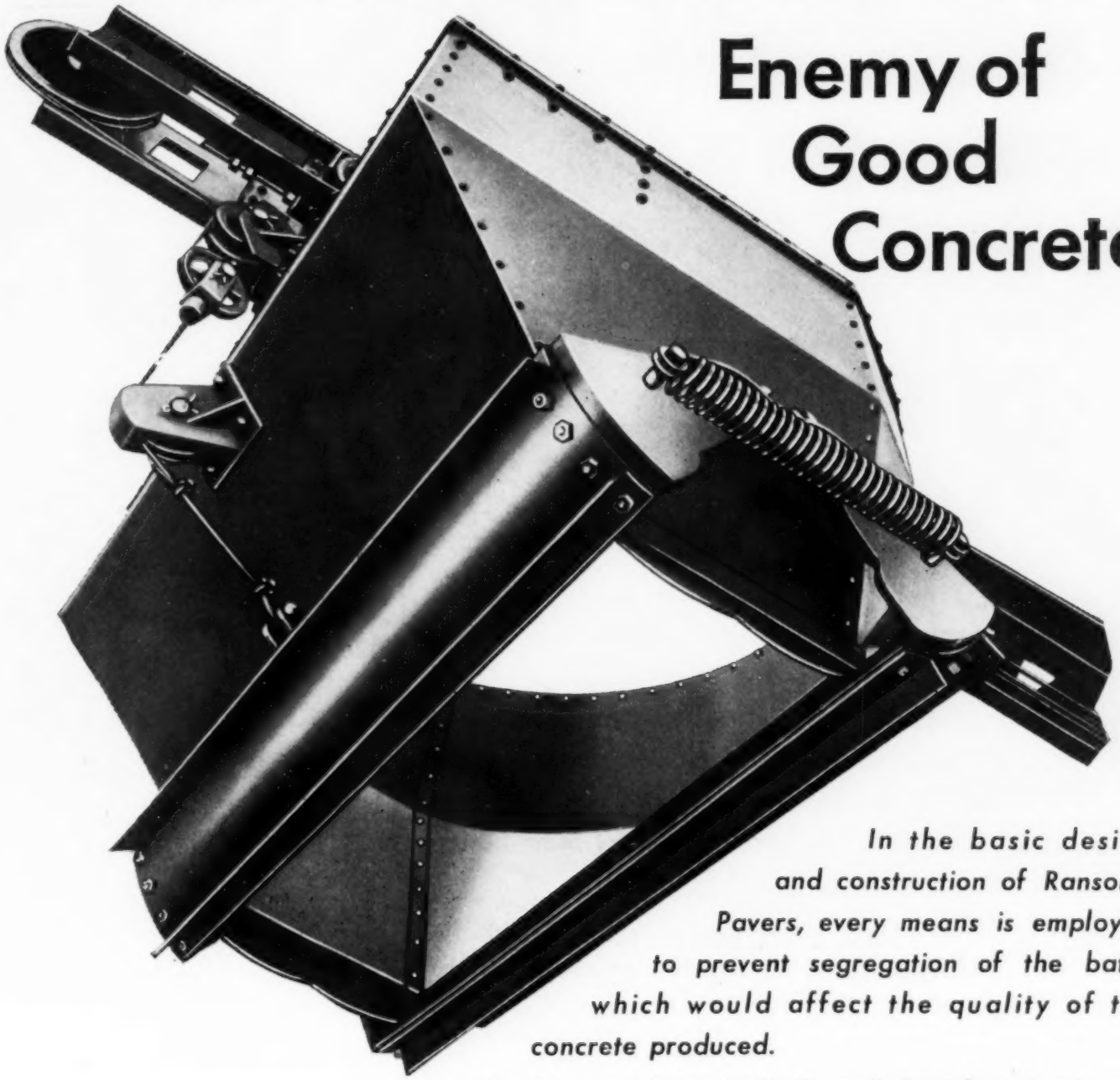
ENGINES..15 to 250 H.P...**DETROIT DIESEL ENGINE DIVISION,** Detroit, Mich.

ENGINES...150 to 2000 H.P.....CLEVELAND DIESEL ENGINE DIVISION, Cleveland, Ohio

LOCOMOTIVES.....ELECTRO-MOTIVE DIVISION, La Grange, Ill.

SEGREGATION...

Enemy of Good Concrete



In the basic design and construction of Ransome Pavers, every means is employed to prevent segregation of the batch which would affect the quality of the concrete produced.

The Ransome Hydraulically Controlled Boom Bucket is provided with gates that slide out of the path of the concrete when the bucket is discharging, giving it full unimpeded flow to the subgrade. The bucket gates can be opened to any degree permitting good spreading action, or dumping of part of the load thus eliminating split batches.

This is but one of many important features found only on Ransome Pavers. On your next paving job, use a Ransome. . . . We will be glad to give more reasons why you should.

RANSOME 34E SINGLE AND DUAL DRUM PAVERS ARE HYDRAULICALLY CONTROLLED!

CONSTRUCTION EQUIPMENT DIVISION **Ransome MACHINERY COMPANY**
DUNELLEN, NEW JERSEY
SUBSIDIARY OF WORTHINGTON PUMP AND MACHINERY CORPORATION

LIGHTEN THE LOAD

ON YOUR MAINTENANCE MEN!

SAVE TIME FOR YOU! Delvac Oils have remarkable protective qualities that give you far cleaner, safer engines than older-type oils. They resist formation of "lacquer," "varnish," sludge deposits—guard against corrosion of hard-alloy bearings. Mean fewer, shorter time-outs for engine cleanings, breakdowns—more man-hours on the job—less in the shop!

ASK FOR DELVAC!

OTHER SOCONY-VACUUM TIME-SAVERS:

MOBILUBE "V"—Developed primarily for wheel bearings and grease-type universal joints, this special, short fiber, soda soap grease is remarkably efficient, long-lasting and suitable for year around service. Also recommended for clutch release bearings and other automotive parts operating at high temperatures.

MOBILUBE GEAR OILS—Highly stable, straight mineral gear oils for automotive use, specially built to meet heavy-duty requirements. Free of abrasives, soaps, fillers, all foreign material—will not thicken excessively when cold. Excellent protection against "scuffing," pitting, corrosion!

Talk with your Socony-Vacuum Representative

Mobilgas
SOCONY-VACUUM

USE SOCONY-VACUUM FUELS, LUBRICANTS, AND ENGINEERING SERVICE!

KEEP ENGINES "ON SCHEDULE" WITH SOCONY-VACUUM'S FAMOUS

DELVAC *Heavy-Duty* OILS

SOCONY-VACUUM OIL CO., INC., and Affiliates: Magnolia Petroleum Co., General Petroleum Corp. of Calif.

When your construction job calls for . . .

A TOUGH AIR COMPRESSOR

. . . . SCHRAMM FITS THE BILL!

"LOOK CARLOS-MIRACLES NEVER STOP-WE SIT IN SHADE AND ARE OVERHEATED-YET THE SCHRAMM COMPRESSOR WORKS WITH SLIDE DOORS CLOSED AND DON'T GET OVERHEATED!

So you've another tough construction job that calls for an air compressor *able to stand anything?*

This ruggedness you specify—it's a big feature in Schramm Air Compressors. Note, for instance, in the above action picture how easily Schramm is doing the compressed air job—and giving all the air needed.

And—during these hot summer months—the fact that Schramm Compressors are completely watercooled to give service equal to winter weather months, means an advantage worth noting.

Schramms are lightweight—compact—sturdy units. If you are not already using a Schramm Air Compressor, it will pay you to write at once for illustrated Bulletin EC-44.

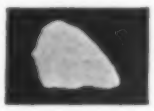
SCHRAMM INC. THE COMPRESSOR PEOPLE WEST CHESTER PENNSYLVANIA

From Subsoil to Surface

PUT CALCIUM CHLORIDE TO WORK IN YOUR PROJECTIVE MAINTENANCE

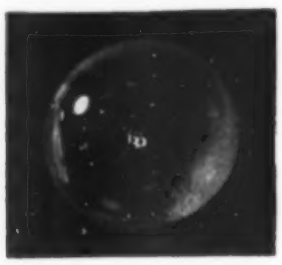
Mighty Moisture Magnet

The moisture absorbing action of calcium chloride is a powerful natural force, easier to show than explain. The following picture shows how calcium chloride dissolves itself in the moisture it attracts.



This picture shows a flake of calcium chloride about twice its natural size, just as it comes out of the bag—dry, easy to spread on the surface of the road.

The same flake 24 minutes after exposure to the air at a normal summer temperature of 77° and a relative humidity (moisture content of the air) of 78%. At this temperature and humidity, a pound of flake calcium chloride will take up about 2¾ lbs. of water.



The same flake 180 minutes (three hours) after exposure to same air conditions, having completely dissolved itself in the moisture it attracted. This absorbed moisture has high evaporation resistance and non-freeze properties.

CORRECT SUBGRADE FAULTS

By eliminating frost boils and preventing detrimental heaving. Research and field work show that effective and economical results are obtained by impregnating subgrade soils with calcium chloride.

STRENGTHEN WEAK BASE COURSES

By substantial patching and extended addition of well-graded soil-aggregates, when and where necessary. Calcium chloride will: (1) Permit cutting the binder-soil fraction to a minimum, (2) accelerate compaction and (3) preserve the stability.

CONSOLIDATE LOOSE GRAVEL SURFACES

By correction of the soil-aggregate composition and calcium chloride treatment. The evaporation-resistant moisture binds the surface materials together to preserve stability and prevent gravel loss.

STABILIZE PAVEMENT SHOULDERS

By shouldering with well-graded soil-aggregates, stabilized with calcium chloride. This will provide substantial foundation for traffic turnout and base for future seal-coating.

EXPEDITE CONCRETE PAVEMENT PATCHING

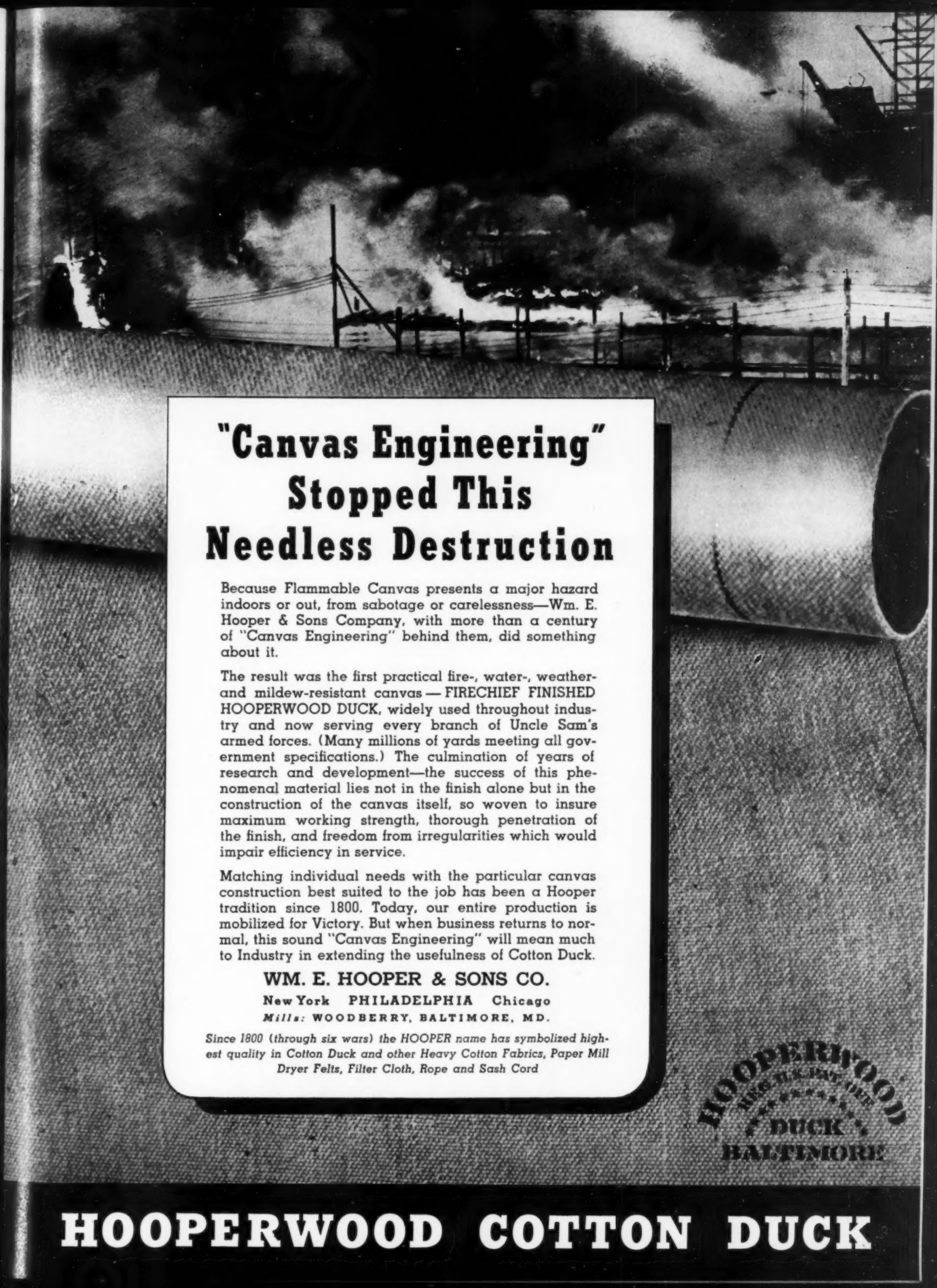
By using calcium chloride in the mix. Pavements can be opened to traffic in 24 hours because calcium chloride gives early strength and "built-in curing."

New Literature Explains Methods

A series of technical and practical working bulletins explain methods of construction and maintenance. Write for Bulletin No. 31, "Projective Maintenance" which includes a list of Bulletins available. Calcium Chloride Association, 4145 Penobscot Building, Detroit 26, Michigan.

CALCIUM CHLORIDE

FOR BETTERMENT IN ROAD MAINTENANCE



"Canvas Engineering" Stopped This Needless Destruction

Because Flammable Canvas presents a major hazard indoors or out, from sabotage or carelessness—Wm. E. Hooper & Sons Company, with more than a century of "Canvas Engineering" behind them, did something about it.

The result was the first practical fire-, water-, weather- and mildew-resistant canvas — FIRECHIEF FINISHED HOOPERWOOD DUCK, widely used throughout industry and now serving every branch of Uncle Sam's armed forces. (Many millions of yards meeting all government specifications.) The culmination of years of research and development—the success of this phenomenal material lies not in the finish alone but in the construction of the canvas itself, so woven to insure maximum working strength, thorough penetration of the finish, and freedom from irregularities which would impair efficiency in service.

Matching individual needs with the particular canvas construction best suited to the job has been a Hooper tradition since 1800. Today, our entire production is mobilized for Victory. But when business returns to normal, this sound "Canvas Engineering" will mean much to Industry in extending the usefulness of Cotton Duck.

WM. E. HOOPER & SONS CO.

New York **PHILADELPHIA** Chicago

Mills: WOODBERRY, BALTIMORE, MD.

Since 1800 (through six wars) the HOOPER name has symbolized highest quality in Cotton Duck and other Heavy Cotton Fabrics, Paper Mill Dryer Felts, Filter Cloth, Rope and Sash Cord

HOOPERWOOD REG. U.S. PAT. OFF. DUCK BALTIMORE

HOOPERWOOD COTTON DUCK

STOP

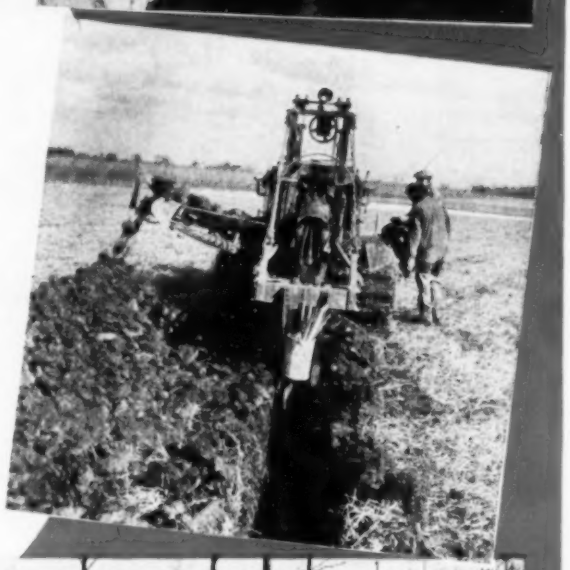
These "Thieves" with Buckeye Trenchers!

Every year erosion and oxidation needlessly take a tremendous toll of public and private property. Power, light and telephone lines placed underground escape the attacks of rain, ice and sun and are free from expansion and contraction stresses resulting from temperature changes.

In addition, buried cables enhance the appearance of any community and eliminate a hazard to aviation.

Every spring hundreds of thousands of basements are flooded, destroying merchandise and visiting havoc on home owners; all of which could be eliminated by proper drainage. Many highways and streets are damaged in the same places year after year because of improper drainage.

There are limitless essential post-war trenching jobs awaiting the Buckeye trenchers to do them—jobs that will stop the costly deterioration of transmission lines and arrest the destruction of property. Jobs that will increase America's assets. Rugged, soundly engineered Buckeye trenchers can do the trenching faster, and at minimum cost. *Plan ahead*—ask for Trencher Catalog.

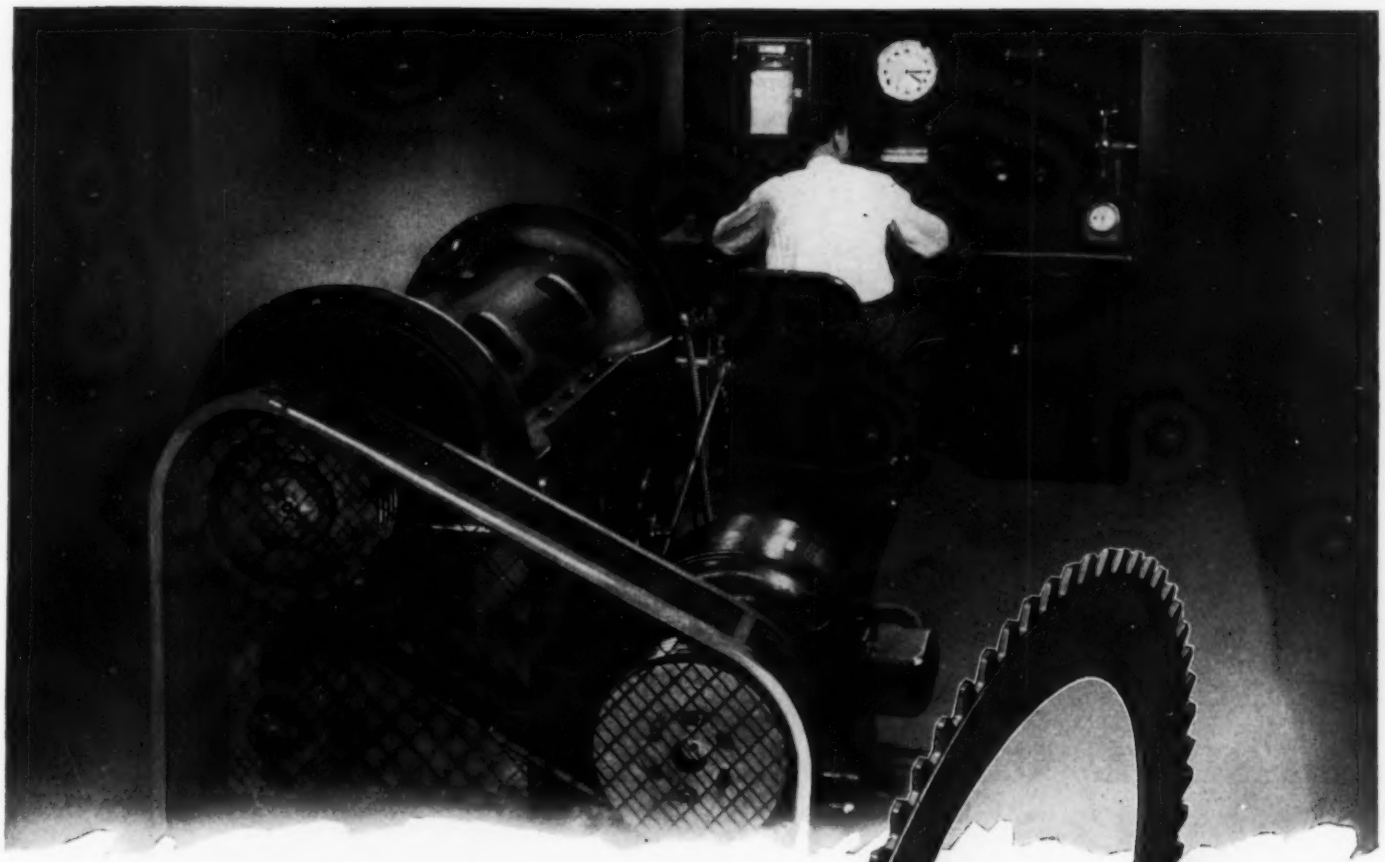


BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO

Top: "Digging Wheel" Buckeye trenching for steam mains at a Naval Base. Center: Model 12 Buckeye trenching for telephone cable near airport. Above: Fast, compact "boom type" Model 410 digs trench for water main in Michigan. Left: Model 120 "boom type" Buckeye trenching for drainage, sewage, water, gas, steam and electric cable at new Veterans' Hospital, Hines, Illinois.

Built by Buckeye ✓

Convertible Shovels Road Wideners Trenchers
Spreaders R-B Power Finegraders Tractor Equipment



...to give you BETTER friction materials

The large and well equipped Wellman laboratories are devoted exclusively to testing *rubbing surfaces.* With many different types of dynamometers and much other specialized equipment, our skilled engineers are engaged in continuous study of powdered metal friction materials. The result: Velvetouch clutch facings and brake linings give you the utmost in dependable performance and long wear. Specify Velvetouch for replacements in your tractors, scrapers, shovels and other earth-moving equipment.

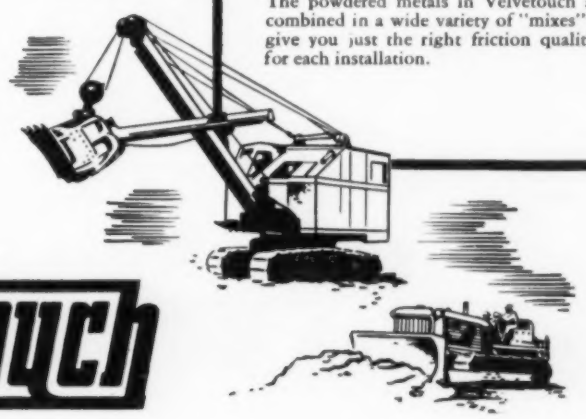
THE S. K. WELLMAN COMPANY
1374 East 51st Street • Cleveland 3, Ohio

Interesting facts about *Friction*

Whenever a pair of surfaces rub together, friction is developed which tends to retard the motion. Friction between like bodies is greater than between unlike bodies, hence the reason for steel shafts housed in bronze journals.

Hard wood rubbing against hard wood under certain conditions would have a coefficient of slightly less than .5. On the other hand, lubricated wrought iron on hard wood under the same conditions would have a coefficient of less than .1.

The powdered metals in Velvetouch are combined in a wide variety of "mixes" to give you just the right friction qualities for each installation.



FOR BRAKE AND CLUTCH USE Velvetouch

SOUTHWEST *Hauling Scoop*

SINGLE CABLE CONTROL

Here it is—the first rear dump hauling scoop with *single cable control!* No longer is it necessary to have hydraulic equipment to have a rear dump unit. Southwest does it with the single cable control. And here are some of the advantages: Dumps safely over embankments—Works well in difficult places—Dumps while moving forward, backward or standing still—Shortens operational cycles by *controlled* spreading. Sturdy design and construction to handle tough jobs easily. Ideal for road maintenance and repair.

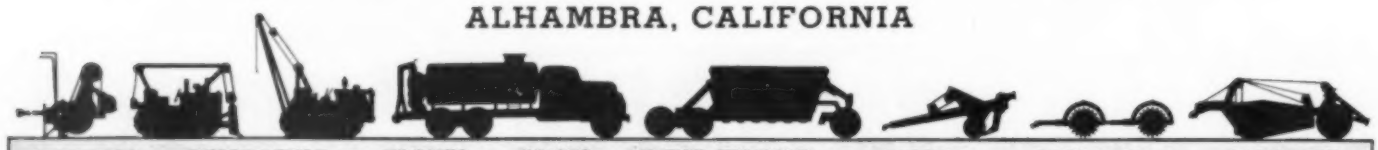
Four page bulletin available on request. Gives engineering data on the three standard sizes of Southwest Hauling Scoops. Write Department A130 Southwest Welding & Manufacturing Company, Alhambra, California.

The Southwest Single Cable Control Scoop can be operated by a single drum or as a "dozer scoop" combination with double drum unit.

CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

ALHAMBRA, CALIFORNIA



WINCHES BULLDOZERS CRANES TANKS DUMP WAGONS RIPPERS TAMPERS SCRAPERS

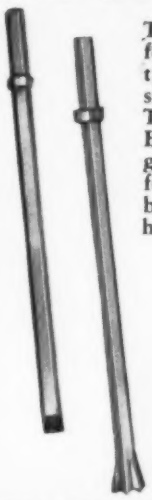
IT PAYS TO SPECIFY...

...for all Pneumatic Tools

BECAUSE THEY ARE MADE TO FIT THE JOB BY PNEUMATIC TOOL MEN WHO KNOW MINING NEEDS!

To *save you time,* Thor Air Tool Accessories are designed to *fit* the job... and do it *right* by Thor Pneumatic tool engineers who *know mining needs!* To *save you money,* Thor Accessories are durably built to help you get the *most* from your air tools. Two good reasons why – whatever your needs – it *pays to specify* "Genuine Thor Accessories."

DETACHABLE BITS & ROCK DRILL STEELS



Thor makes available for rock drilling in all types of formations sturdy, fast-cutting Timken Detachable Bits. All standard gauges from 1⅜" to 2⅝" in four-point, six-point or chisel bit styles with center or side holes.

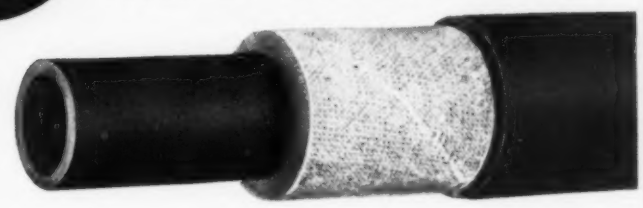
ROSE BIT

CROSS BIT

CHISEL BIT

- Seven sizes of Thor Hollow Steels for these detachable bits used with hand-held drills, and seven sizes for drifter drills, all specially heat-treated for durability in toughest formations.
- Five Thor Hollow Drill Steels with four- or six-point bits in two size ranges – with ⅞" Hexagon steel and 3¼" collared shank, and 1" Hexagon steel with 4¼" collared shank.

Thor AIR & WATER HOSE



OIL RESISTANT

DURABLE

You get protection against both inner and exterior wear with Thor Wrapped Air and Water Hose. Multiple plies of light, yet tough rubber compounds combine with this protection important advantages of flexibility and durability. The inner tube is protected against flaking and decomposition from oil in the air stream by a special oil-resistant compound. Cover consists of a tough, abrasion-resistant rubber compound that withstands roughest usage.

Thor HOSE FITTINGS

Thor Hose Fittings for use with all types of Air and Water Hose are specially designed to withstand severest conditions in mines, quarries and on construction jobs. Solidly constructed of high quality steel, heat treated for durability. Each coupling consists of stem, nut packing, washer, clamp and spud, which is furnished with either male or female thread for connection to the pipe or machine.

HOSE CLAMP · HOSE STEM · HOSE UNION NUT · HOSE SPUDS · HOSE UNION NUT · HOSE STEM · HOSE CLAMP

Thor *Portable Pneumatic and Electric Tools*

INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

PROMPT DELIVERY! Thor Air Tool Accessories *available now* . . . write for complete information, specifications and prices.

6200 E. SLAUSON AVE., LOS ANGELES, CAL.
315 S. VAN NESS AVE., SAN FRANCISCO, CAL.
1741 FIRST AVE., S., SEATTLE, WASH.
54 E. FOURTH, S., SALT LAKE CITY, UTAH

"Pay Dirt!"

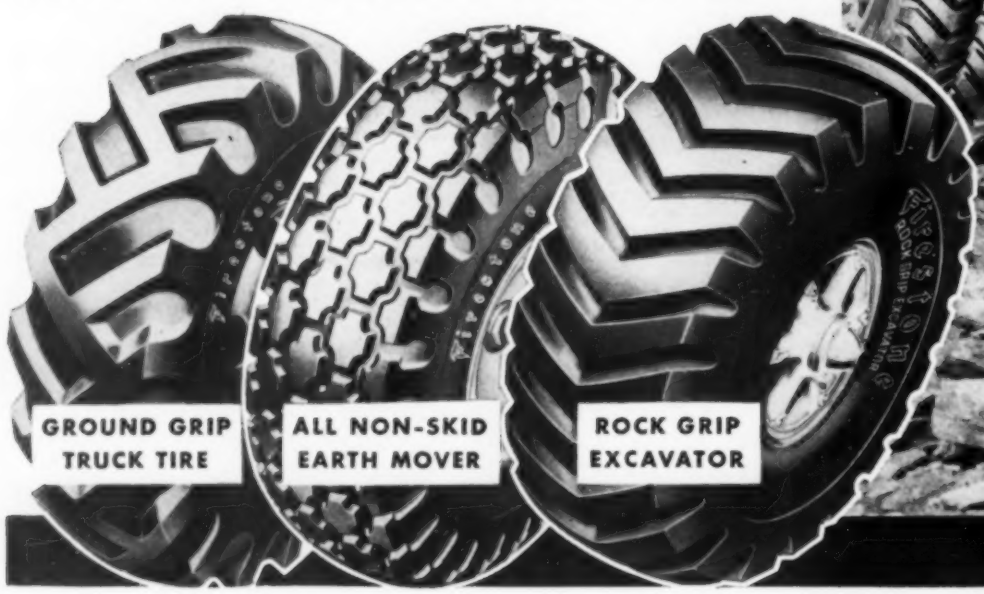
EVERY contractor knows that the real "pay dirt" is the extra dirt he moves without increasing operating expense. And he knows too that the tires that make those extra "pay loads" possible are the tires that have extra quality built into them—the tires that give extra performance at no extra cost.

Firestone Off-the-Highway tires are built to do just that. The cord bodies are made of high tensile cord which is specially processed and gum-dipped to withstand terrific tension and strain. Four extra tread plies cushion and protect the body against sharp impacts. The tread is tough, cut-resistant. The sidewalls are double thick—armored to withstand severe punishment.

These are the reasons why Firestone Tires can help increase your "pay loads." They're designed to do the job; and they're built to stay on the job.

Listen to the Voice of Firestone every Monday evening over N. B. C.

Firestone
OFF-THE-HIGHWAY TIRES



Copyright, 1944, The Firestone Tire & Rubber Co.

INDIAN TRAIL TO TOKYO

Rugged OSGOODS and Native Labor Help Army Engineers Blaze Vital Chinese Supply Line Through Burma.

U.S. Army supply lines are inching their way across the dense jungles of northern Burma along a route known as the Ledo Road. The ultimate terminus for which our engineers are fighting and sweating, digging and building is . . . Tokyo.

Helping to clear the way and move the dirt along this virgin trail are husky, mobile OSGOOD Shovels. It's a tough job; as tough a test as you'll find for ingenious men and machines. That OSGOOD'S measure up — here as well as in battle areas all over the map — is a good thing to remember.

For someday your money, now invested in War Bonds will be buying new equipment, and when that day comes OSGOOD power, maneuverability and durability will be ready to deliver the proven performance you want!

U. S. Army, Signal Corps and OWI Photos

Ledo Road to China — through tangled jungle, over innumerable rivers, streams and chasms, and blasted out of tree-covered hillsides —will in due time carry Allied supplies for the storming of Tokyo.

THE GENERAL EXCAVATOR COMPANY
CRANES, DRAGLINES AND SHOVELS
DIESEL, GAS, ELECTRIC

Associated with The General Excavator Company
OSGOOD
CRANES-SHOVELS MARION OHIO U.S.A. OSGOOD GENERAL
THE OSGOOD COMPANY • MARION, OHIO

OSGOOD
SHOVELS, DRAGLINES CRANES
CRAWLER & WHEEL MOUNTS
DIESEL, OIL, GAS, ELECTRIC

Gulf Products

help contractor get top performance from equipment on naval hospital project

R. A. Bowen, Macon, Georgia, was awarded two separate contracts on this U. S. Navy Hospital project. The first, which was finished ahead of schedule, required grading 500,000 yards of earth. The second, now well along, calls for moving 200,000 yards. Complete landscaping is involved in both contracts. The photo directly above shows a Gulf Service Engineer (right) consulting with Superintendent E. J. Smith and Assistant Superintendent C. F. Myer on lubrication and fuel requirements for the job.

"No unnecessary delays, and better all-round job efficiency with Gulf lubricants and fuels are two important reasons why we're ahead of schedule"—

says Superintendent E. J. Smith

R. A. Bowen is pushing equipment to the limit to finish all grading operations ahead of schedule on the huge naval hospital project pictured above. Gulf quality lubricants and fuels are helping keep this equipment continuously on the job and operating at maximum efficiency. Superintendent E. J. Smith has found that it's good job insurance to specify Gulf products.

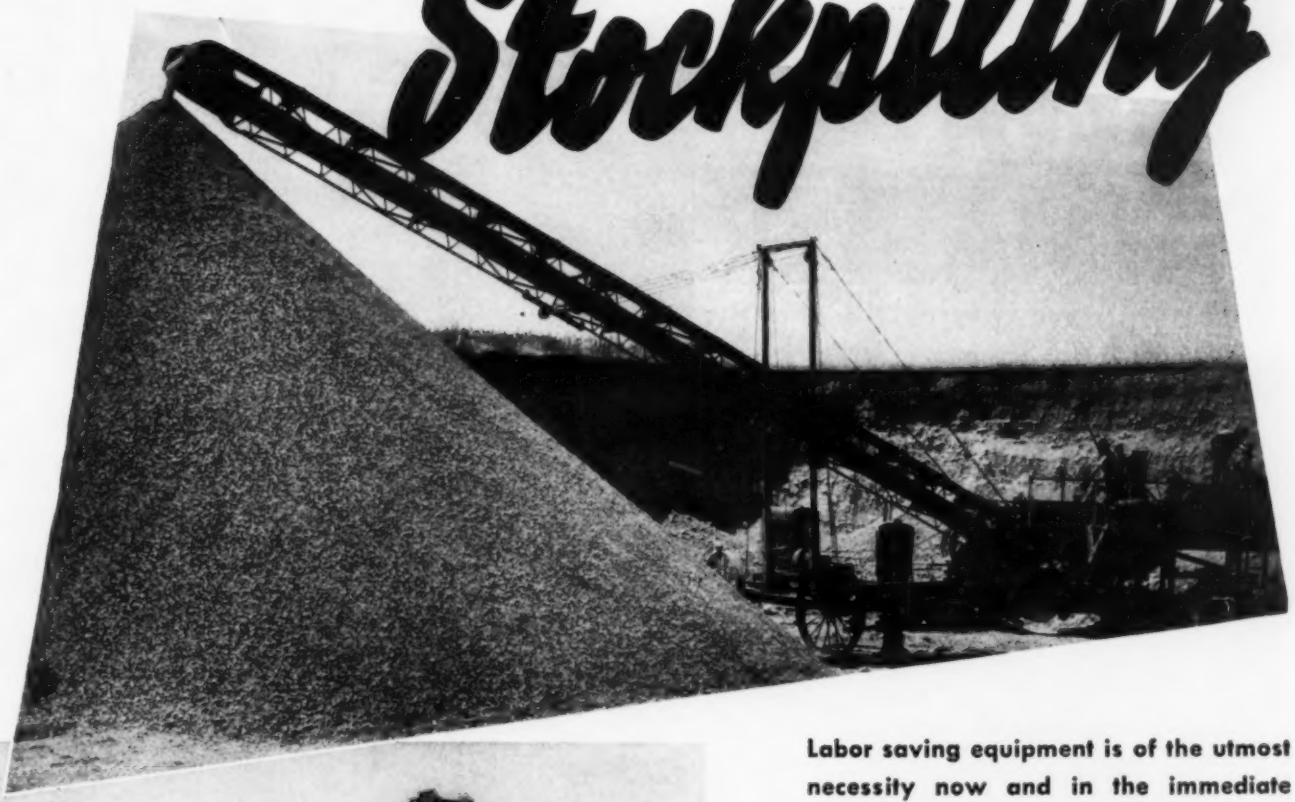
On job after job throughout the country Gulf quality lubricants and fuels are playing an enormously important part in keeping contracting equipment rolling on fast schedules and under punishing operating conditions. They work as a team to insure top performance, a minimum of delays, and low maintenance costs.

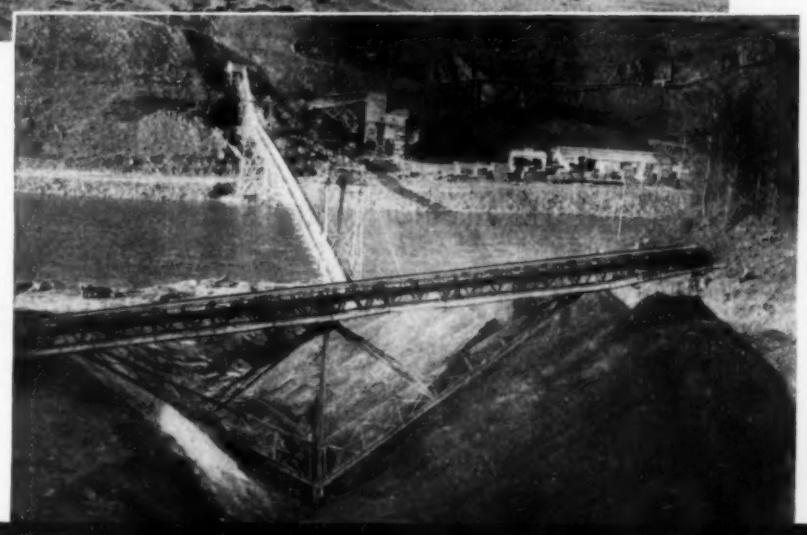
You, too, can enjoy the proven benefits provided by Gulf products. No matter where your job is located, you are sure of quick delivery through more than 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office today.

GULF

GULF OIL CORPORATION · GULF REFINING COMPANY
GULF BUILDING · PITTSBURGH 30, PA.

Stockpiling





Labor saving equipment is of the utmost necessity now and in the immediate months to come. To meet this need, WPB has released a limited schedule of Barber-Greene Model 82-A Bucket Loaders and Wheel Mounted and Permanent Belt Conveyors.

Preparation of aggregate and stock piling sized material is greatly facilitated with Barber-Greene Permanent and Portable Belt Conveyors. Reclaiming from stock piles is speeded up using the high capacity Model 82-A Bucket Loader, requiring less idle truck time. Often truck drivers easily fill in as loader operators loading their own trucks.

Barber-Greene engineers can assist you in utilizing your present equipment to its fullest advantage, as well as suggesting new equipment if it is necessary. Write to Sales Engineering Department, Barber-Greene Company, Aurora, Illinois, U.S.A.

44-24

BARBER-GREENE

AURORA, ILL.

LIMA PAYMASTER

CAPACITIES
SHOVELS - ¾ YARD
CRANES - 13 TONS
DRAGLINES - VARIABLE

The LIMA *Paymaster* has established records of big production and low operating and maintenance cost on every conceivable kind of work suited to a shovel, crane or dragline of ¾ yard capacity. Its modern design, and many practical features, assures big output with maximum economy and efficiency. See a LIMA *Paymaster* in action and make your own comparison. You will be convinced that it is the biggest little machine on the market.

Bulletins are available, write today for a copy.

LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division — LIMA, OHIO, U. S. A.

NEW YORK, N. Y. · PHILADELPHIA, PA. · MEMPHIS, TENN. · ST. LOUIS, MO. · NEWARK, N. J. · PORTLAND, ORE. · DALLAS, TEXAS · SEATTLE, WASH.
SAN FRANCISCO, CALIF. · LOS ANGELES, CALIF. · MINNEAPOLIS, MINN. · SPOKANE, WASH. · VANCOUVER, B. C. · MONTREAL, QUEBEC, CANADA

LIMA

SHOVELS
DRAGLINES
CRANES

SHOVELS, ¾ YD. TO 3½ YD.
CRANES, 13 TONS TO 65 TONS
DRAGLINES, VARIABLE

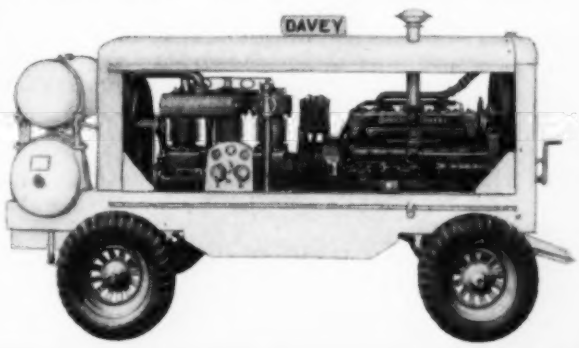
FOR LONGER LIFE, LOWER MAINTENANCE IN AIR COMPRESSORS

Take a chassis built to endure the shocks and jolts of hard service year in and year out, add an amazingly economical, ruggedly-built air-cooled compressor that operates at conservative speed, and you have the DAVEY Air-Cooled Portable Compressor.

Cost-wise contractors and dealers who lease out equipment know a DAVEY can really take it and still keep going year after year with minimum maintenance and maximum efficiency. That's why many rental fleets are 100% Davey Compressors.

Look at the additional advantages Davey Compressors offer you—

- ✔ AIR-COOLED — No water to freeze, no radiators to clog, no water pumps to wear out.
- ✔ SAVES MONEY — Economical, conservative speed cuts maintenance costs, keeps moving parts running longer.
- ✔ DAVEY ENGINEERED—Electrically-welded, reinforced frame —aluminum - alloy heads — individual compressor cylinders —guaranteed life-time valves.



Next time you need an air compressor, check into DAVEY and watch your lower compressed-air costs slip "money in your pocket" on every job.

The **DAVEY LINE-**

AIR-ARISTOCRAT PORTABLE COMPRESSORS

★

TRACK-AIR COMPRESSORS

★

TRUCK-POWER TAKE-OFFS

★

PNEUMATIC SAWS

★

INDUSTRIAL STATIONARY COMPRESSORS

★

MINE RAILWAY COMPRESSORS

★

AUTO-AIR COMPRESSORS

★

Write Today For YOUR Copy of The New DAVEY CATALOG E-172

DAVEY *Compressor Co.*

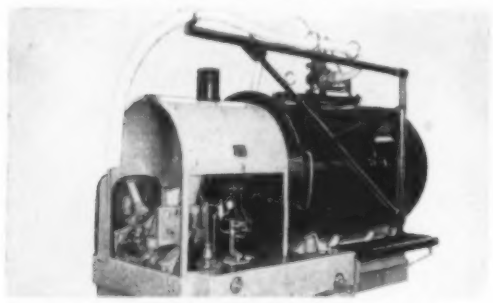
KENT, OHIO

DEALERS IN PRINCIPAL CITIES

ARMY E NAVY

FOR MORE PRODUCTIVE HOURS FROM BITUMINOUS HEATING EQUIPMENT...RELY ON CLEAVER-BROOKS DEPENDABILITY AND DURABILITY

Mobile tank-car heater available in two and three tank-car sizes. Oil-fired with exclusive design four-pass flue travel; dry-coil steam condensate return under pressure — no water or heat loss.



Portable pumping booster. Heats by direct firing in one operation loading directly to distributor, relay truck or returning to tank-car. Available in 2 sizes—truck mounting or 4 wheel trailer.

Truck mounted pumping booster in service of Oklahoma Bituminous Distributing Co., Ada, Okla.

☆ Most of the pioneer models of tank-car heaters, built by Cleaver-Brooks fourteen years ago, are still in service.

☆ There are more Cleaver-Brooks tank-car heaters and bituminous boosters in both civilian and military service than all other makes of similar equipment combined.

☆ Service records from hundreds of owners prove Cleaver-Brooks dependability and durability. Cleaver-Brooks equipment is usually assigned to the difficult jobs — the hardest chores—because of its known capacity and reliability.

☆ The design and construction of Cleaver-Brooks heating equipment is subject to constant check — to include every feature that contributes to the most effective performance and long service life.

☆ Cleaver-Brooks heaters are the "finished" product of the pioneers and originators of tank-car heaters and bituminous boosters—built by specialists in the construction of portable and stationary steam generators for construction, industrial and military uses.

On your next bituminous heating equipment purchase you can expect and get more from Cleaver-Brooks—qualified by experience and facilities in this specialized field.

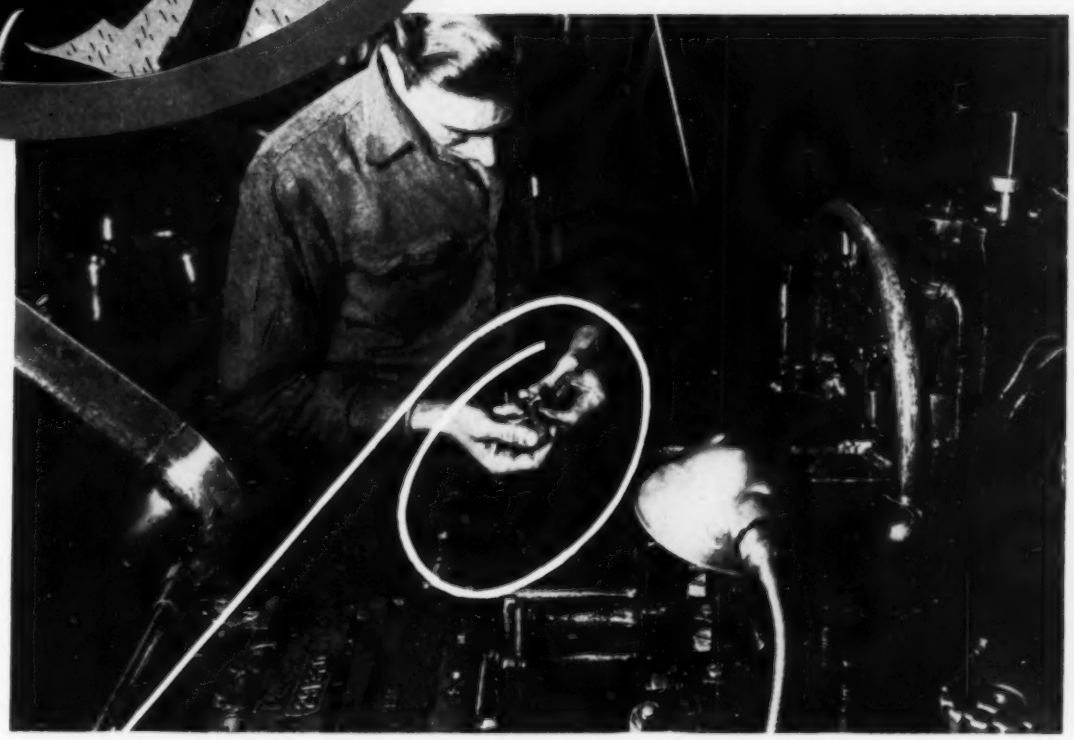
CLEAVER - BROOKS COMPANY
5125 N. 33rd Street • Milwaukee 9, Wisconsin

Cleaver-Brooks

PIONEERS AND ORIGINATORS OF

TANK CAR HEATERS . . . BITUMINOUS BOOSTERS . . . AUTOMATIC STEAM-PLANTS

Dependable construction
made certain
by Oliver Fasteners



Oliver Quality means faster assembly, better structures . . .

Develop the full joint efficiency and strength of your designs by specifying OLIVER bolts, nuts and rivets. These uniform, dependable fasteners—made to close tolerances—insure accurate fits and speedy assembly.

The Oliver line is complete in sizes and types. Materials include mild carbon and alloy steels. Special processing provides heat treatments, galvanizing or zinc plating when required.

Being one of the oldest and largest makers of industrial fasteners, Oliver has the equipment and experience to give you what you need. We will be glad to give you full data on modern fasteners for your particular applications.

OLIVER
IRON AND STEEL
Corporation

SOUTH TENTH AND MURIEL STREETS . . . PITTSBURGH 3, PENNA.

ATLAS MANASITE DETONATORS

Have You Taken This Step to EXTRA SAFETY?

In these wartime days, when labor is often green, it is doubly important to take every step that leads to greater safety and reducing risks.

Atlas Manasite detonators provide an extra factor of safety—at no increase in cost. They have been made to withstand more friction, more impact—and they are reliable in action. They have been used in ever-increasing numbers since they were first introduced five years ago.

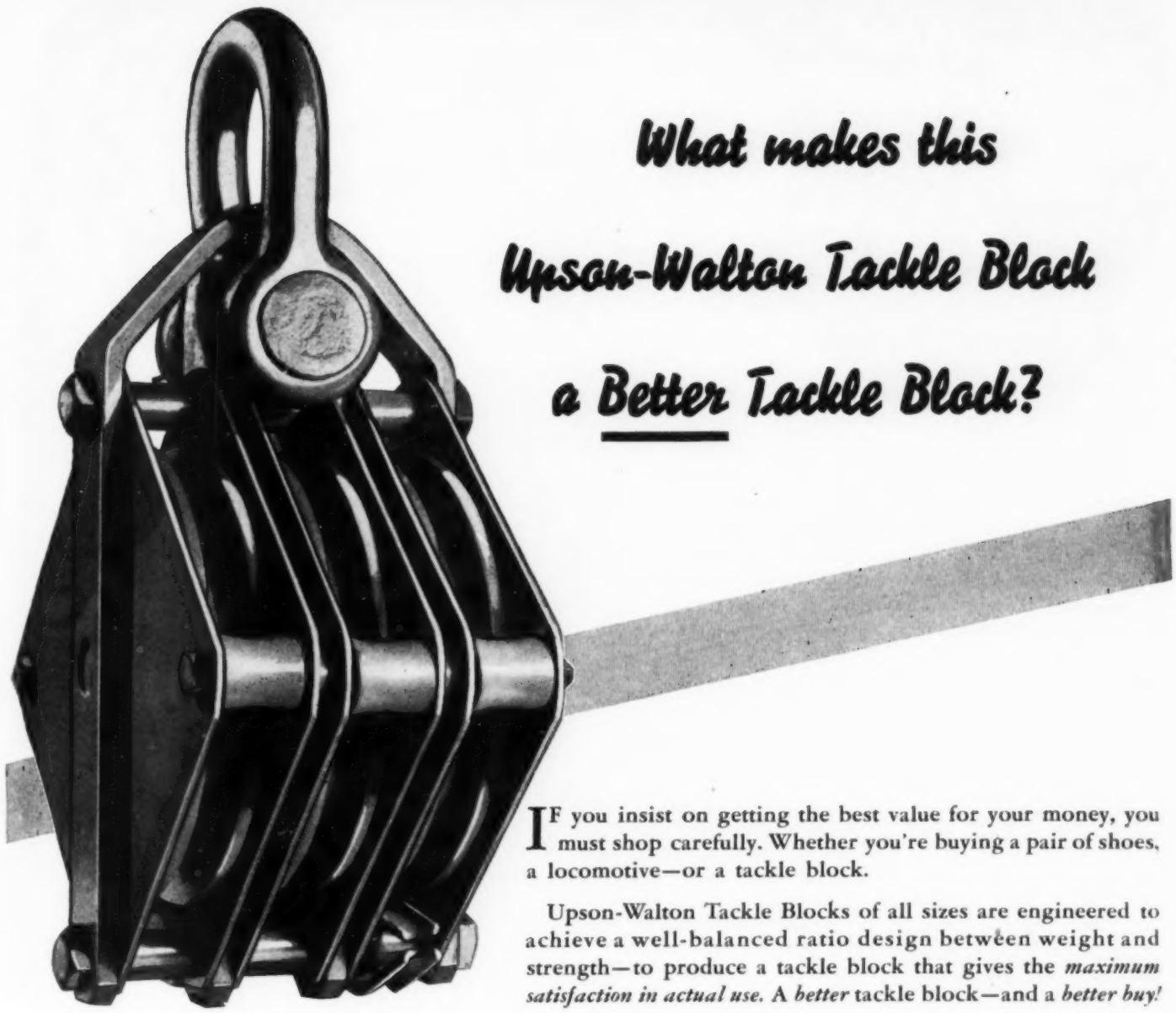
Take this extra step to safety —now. Your Atlas representative will be glad to tell you all about Atlas Manasite detonators.

Manasite: Reg. U. S. Pat. Off.

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*



What makes this Upson-Walton Tackle Block a Better Tackle Block?

IF you insist on getting the best value for your money, you must shop carefully. Whether you're buying a pair of shoes, a locomotive—or a tackle block.

Upson-Walton Tackle Blocks of all sizes are engineered to achieve a well-balanced ratio design between weight and strength—to produce a tackle block that gives the *maximum satisfaction in actual use.* A *better* tackle block—and a *better buy!*

Check this partial list of Upson-Walton specifications before you place your next order for tackle blocks.

COLD ROLLED STEEL center pins provide a smoother surface for the bearing which makes it last longer—gives less friction and more efficient hoisting power.

CLOSE TOLERANCE between sheave bearing and center pin on all Upson-Walton tackle blocks results in longer life for the bearings and a truer-running sheave.

HEAVY SHEET PLATES provide greater protection for sheaves. The block withstands abuse better and rope cannot jam between sheave and shell.

EXTRA HEAVY DROP FORGED connections on all wire rope blocks achieve greater safety, strength and dependability.

HEAVY STRAPS provide greater reserve strength for heavy loads.

ALL SHEAVES are designed with heavy rim and tread sections—rope grooves are long lasting.

AS WE GO TO PRESS, DELIVERIES ON MOST SIZES OF TACKLE BLOCKS ARE GOOD

U-W

Established 1871

THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope. Wire Rope Fittings. Tackle Blocks

NEW YORK • PITTSBURGH • CLEVELAND • BUFFALO • CHICAGO

This big bruiser is not as heavy as it looks (but it's tougher than it looks!)

Universal has led the field in eliminating dead-weight—we've done it again with the NEW "WRB" series *welded steel plate* crushers with cast steel pitmans. Not an ounce of excess metal, yet all the structural strength necessary to prevent distortion of frame or misalignment of bearings. Lateral and transverse ribbing and heavy plate side walls assure absolute stability.

Four big SKF roller bearings—two on the pitman and one on each side—labyrinth sealed against grit and grease and Alemite lubricated, assuring freedom from bearing worries.

Two sizes available in the "WRB" series—30″ x 42″ and 20″ x 36″ feed openings; other sizes later.

A number of Universal "WRB" Crushers are in use. Users of the 30″ x 42″ report from 150 to 200 tons per hour of 4″ material. A 30″ x 42″ crusher on a primary crushing unit built for Art Overgaard, Elroy, Wisc. is shown below. Send for bulletin on the "WRB" line.

The overhead eccentric type jaw crusher, first built by Universal in 1906, has become the most widely accepted method for primary reduction of rock and gravel. While there have been improvements in materials, bearings and construction, there has been no major improvement in this basically sound method of crushing which provides two crushing blows with each revolution of the eccentric—a preliminary blow in the mouth of the crusher and a further reduction in the throat, at the bottom of the crusher. Some of these early crushers are still in use. The Universal "WRB" series employs this original highly efficient crushing principle.

UNIVERSAL ENGINEERING CORPORATION
327 8th St. West **Cedar Rapids, Ia.**

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

Start Post-War Planning Now!

The ASPHALT most widely used by U. S. road builders

Texaco-paved highway in **VIRGINIA**

Texaco-paved street in **TEXAS**

Texaco-paved highway in **NEW YORK**

Texaco-paved airport in **FLORIDA**

Texaco-surfaced road in **COLORADO**

A SIGNIFICANT FACT about Texaco Asphalt is its use in road, street and airport construction by practically every section of the United States. Texaco is more widely used in this country than any other Asphalt.

This unequalled acceptance of Texaco Asphalt by America's road builders is a good indication of the high quality and dependable performance of this product.

Texaco Asphalt Cements, Cut-back Asphalts, Emulsified Asphalts and Surfacing Materials include products for every street, highway and airport need. Among heavy-duty Texaco Asphalt pavements and low-cost Texaco surfaces, there is a type exactly suited to your traffic and climatic conditions.

Consult Texaco Engineers, who are Asphalt specialists, for practical assistance with your post-war paving plans.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd St., New York City 17

Boston 16 Chicago 4 Denver 1 Houston 1 Jacksonville 2 Philadelphia 2 Richmond 19

TEXACO REG. T. M.

TEXACO ASPHALT

The Difference is Greater Than Ever Today!

UNDER wartime conditions, experience counts more than ever before in building off-the-road tires to handle the big jobs.

Into the building of Goodyear tires goes the experience gained in producing more than 350,000,000 pneumatic tires — millions more than any other manufacturer has turned out.

It is this extensive "know-how," combined with such exclusive Goodyear features as multiple compounding, low stretch Supertwist cord carcass and Goodyear's three great time-proved tread designs that give Goodyear off-the-road tires a bigger quality edge than ever before today.

Add to this the fact that Goodyears are built with the maximum amount of new live rubber allowed by the government, and it's easy to see why Goodyears are far and away your best buy today. Remember, there's a reason why "more tons are hauled on Goodyear tires than on any other kind!"

• • •

It's a MUST manual for wartime contractors—SEND FOR FREE COPY—*Goodyear's Off-the-Road Tire Manual tells you what you need to know about getting the most wear out of your tires. To get your free copy of this fact-filled service handbook on proper tire care and maintenance, write Goodyear, Dept: SP, Akron 16, Ohio.*

Goodyear's sound slide film on truck tire conservation is available for showings to group meetings of your drivers and maintenance men. Your Goodyear dealer or serviceman will be delighted to show it to your employes. Ask him about it.

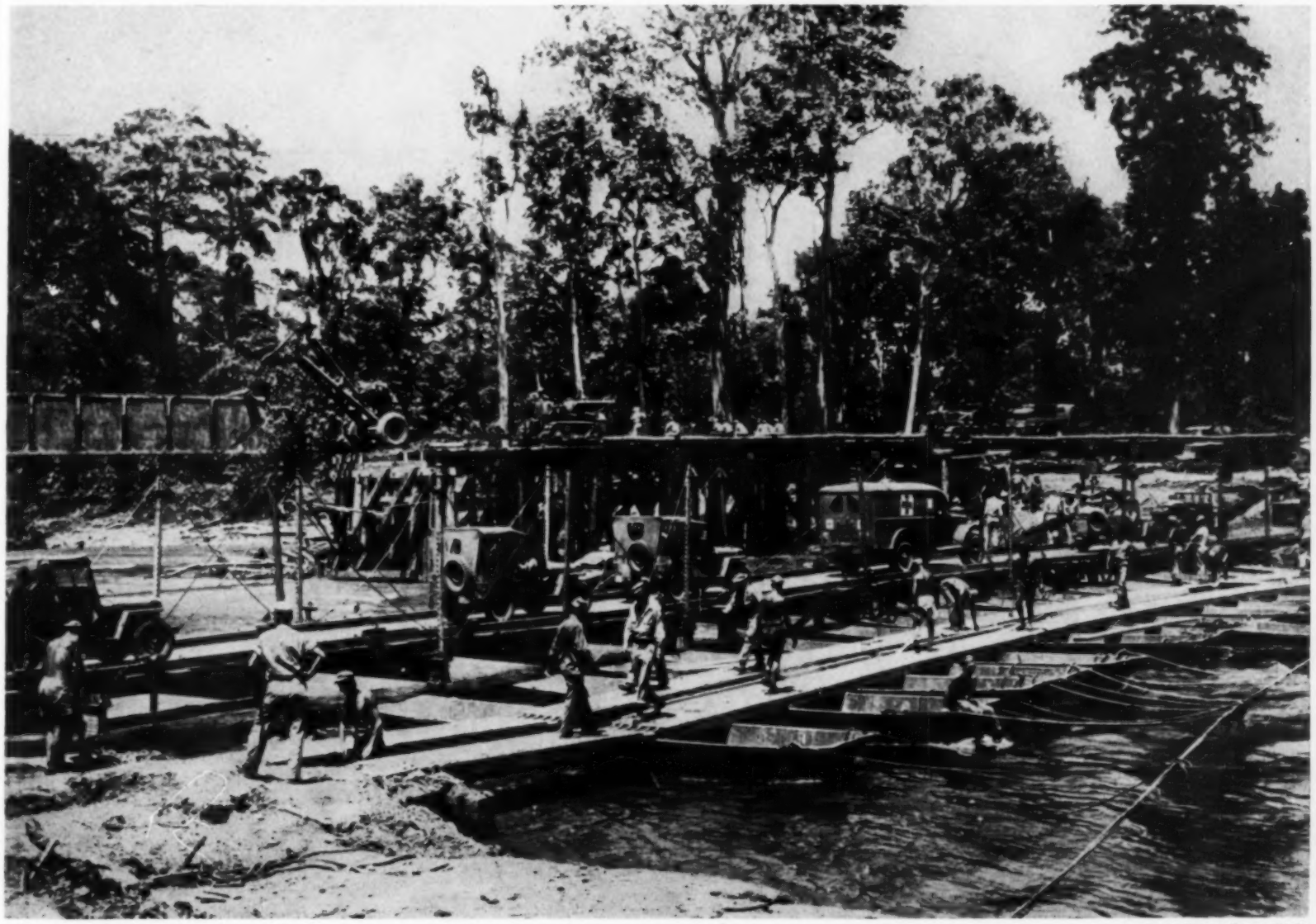
Supertwist, Sure-Grip, All-Weather — T.M.'s The Goodyear Tire & Rubber Company

MORE TONS ARE HAULED ON GOODYEAR TRUCK TIRES THAN ON ANY OTHER KIND

Construction Methods

ROBERT E. TOMLIN, Editor

Volume 26 — JULY, 1944 — Number 7



U. S. Army Signal Corps Photo

ARMY ENGINEERS IN SOUTH PACIFIC

Span Jungle Stream

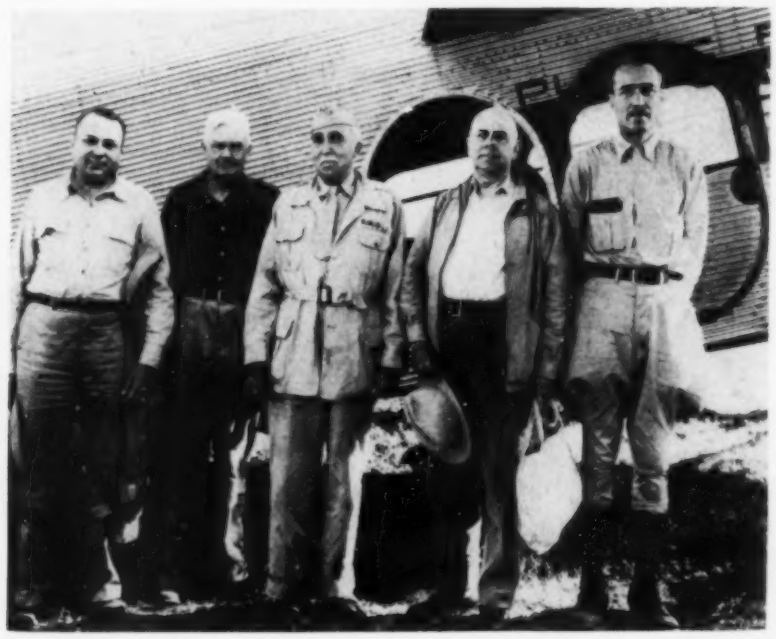
WHEN A FLASH FLOOD in a jungle stream in the South Pacific war theater washed out a portion of the timber trestle bridge shown in the background of the accompanying illustration, U. S. Army Engineers quickly provided a substitute crossing, using their standard ponton equipment. Motor vehicles are seen crossing the stream on the new structure while a tractor-crane is placing a girder to span the gap in the old timber trestle. The girder is an unusual structural member improvised on the job by bolting together a series of the Navy's all-purpose standard 5x5x7-ft. welded steel cells, or buoyancy units.

The site of these operations is on an island recently taken from the Japs in the American advance across the outer perimeter of the enemy's defenses.

IN VANGUARD OF INVASION FORCES landing in France June 6 are these Aviation Engineers here shown rolling out steel mats to provide landing strips for Allied airplanes. This photograph by the U. S. Army Signal Corps was transmitted from London to the War Department at Washington, D. C. by radio-telephoto. It is the first picture received showing Engineer operations in connection with the landing of American invasion forces on the Normandy coast. U. S. Signal Corps Photo

MASS CONCRETE PLACEMENT at Shasta Dam is scheduled for completion early in July by Pacific Constructors, Inc. Shasta Lake already contains more than 975,000 acre-ft. of water awaiting completion of control gates to begin its plunge down 15-ft. penstocks to giant 75,000-kw. generating units in powerplant. Bureau of Reclamation Photo

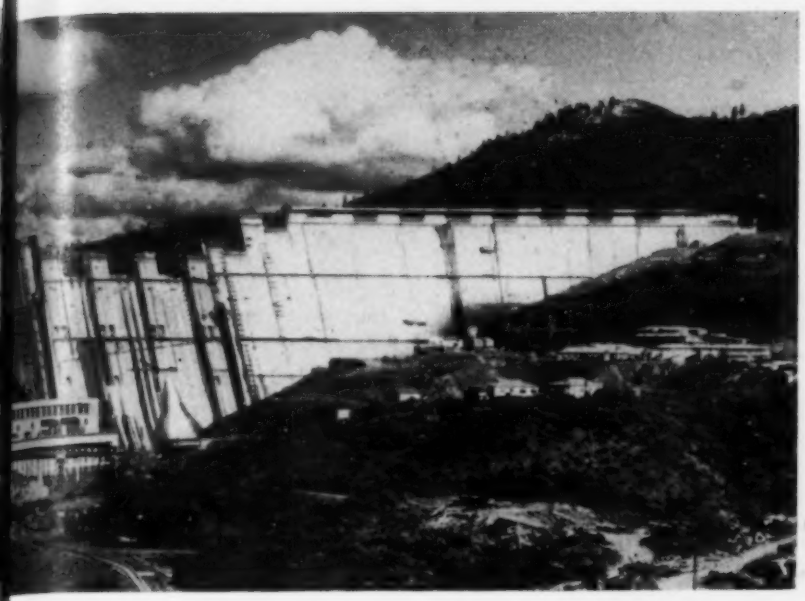
THIS MONTH'S NEWS REEL



ON INSPECTION TOUR of 3,356-mi. Inter-American Highway from Laredo, Tex., to Panama Canal are (left to right): RALPH E. MILLS, contractor; E. W. JAMES, chief, Inter-American Regional Office, Public Roads Administration; MAJOR GENERAL PHILIP B. FLEMING, administrator, Federal Works Agency; THOMAS H. MACDONALD, commissioner, PRA; MARVIN L. HARSHBERGER, PRA engineer in Costa Rica.

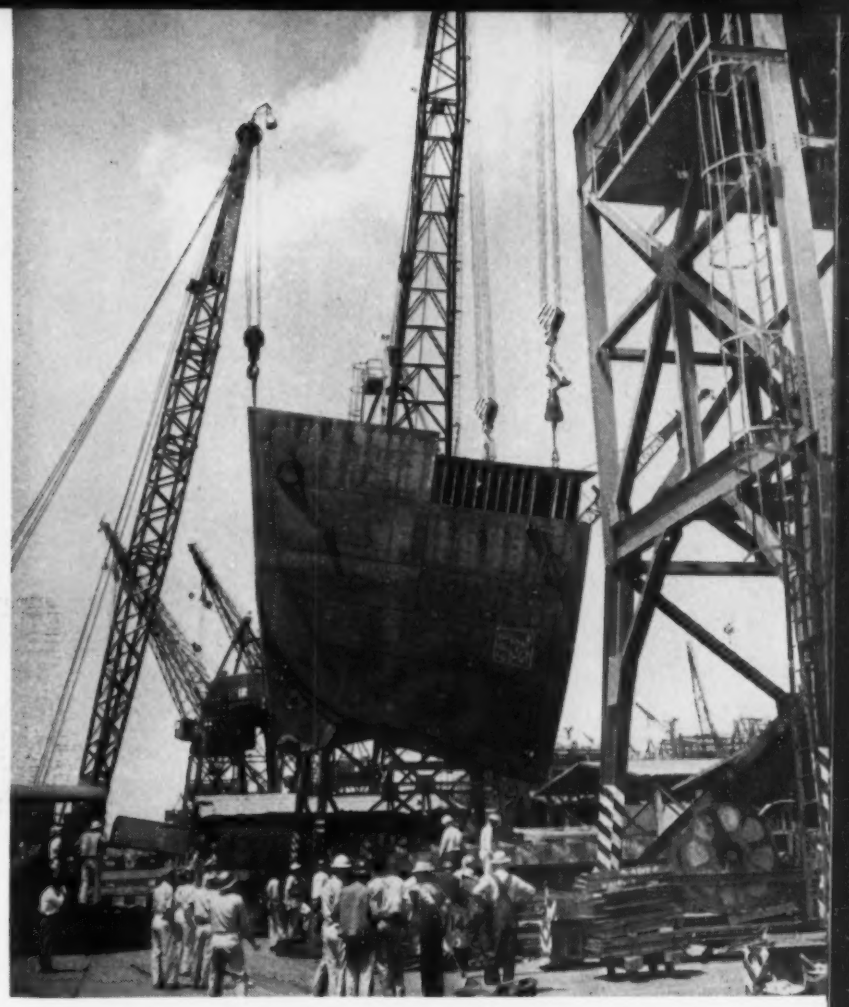
INVASION EQUIPMENT (below) lined up at huge U.S. Army Engineer supply depot, somewhere in England, includes rows of Caterpillar and Allis-Chalmers tractors and bulldozers ready for issue to Engineer units. British Combine Photo

HUGE MANUFACTURING BUILDING (below) of Higgins Aircraft, Inc., at New Orleans, La., (described in "Construction Methods," June, 1944), covers 45 acres under one roof. Said to be second largest plane plant in world, it is



STEEL LANDING MAT SECTIONS, designed primarily for airfield surfacing, are used for flooring of temporary cable suspension foot bridge over jungle stream in New Guinea.

Signal Corps Photo



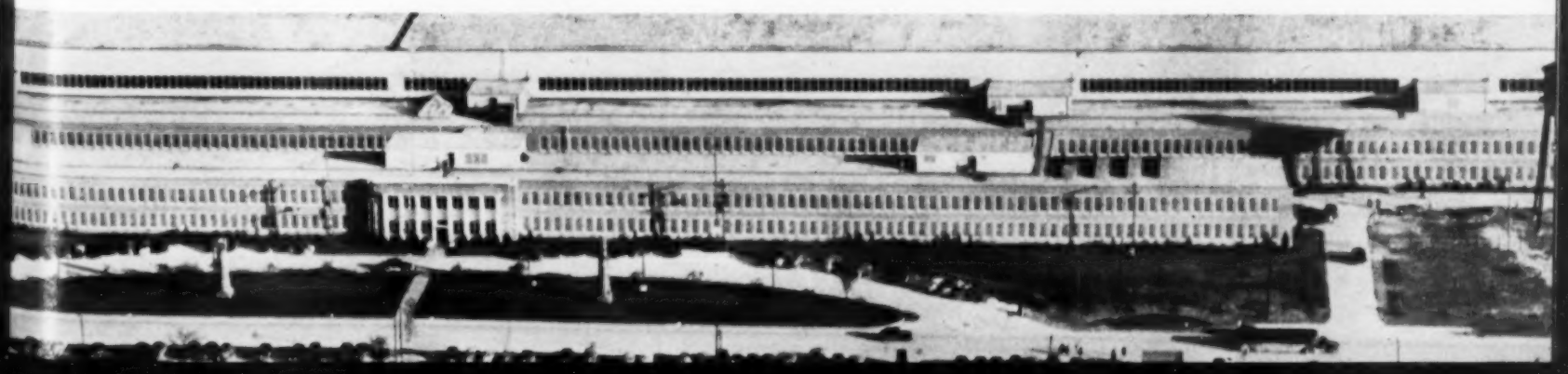
NEW MARITIME COMMISSION GOLD WREATH FLAG has been awarded to California Shipbuilding Corp., signifying completion of 22 ships on each of the yard's ways. From Calship's mile-long line of ways, 353 wartime carriers have already slid. Here 50-ton forepeak is lifted on to Victory ship hull at Los Angeles yards.

Wide World Photo

COMING OFF L.S.T. SHIP at South Pacific island is Buckeye Clipper shovel, which will be used to convert puny landing strip left by Japs into first-class airfield.

Photo, U. S. Coast Guard

only one in Deep South which will handle complete production operation. It was built for Defense Plant Corp. by Turner Construction Co. and Raymond Concrete Pile Co.



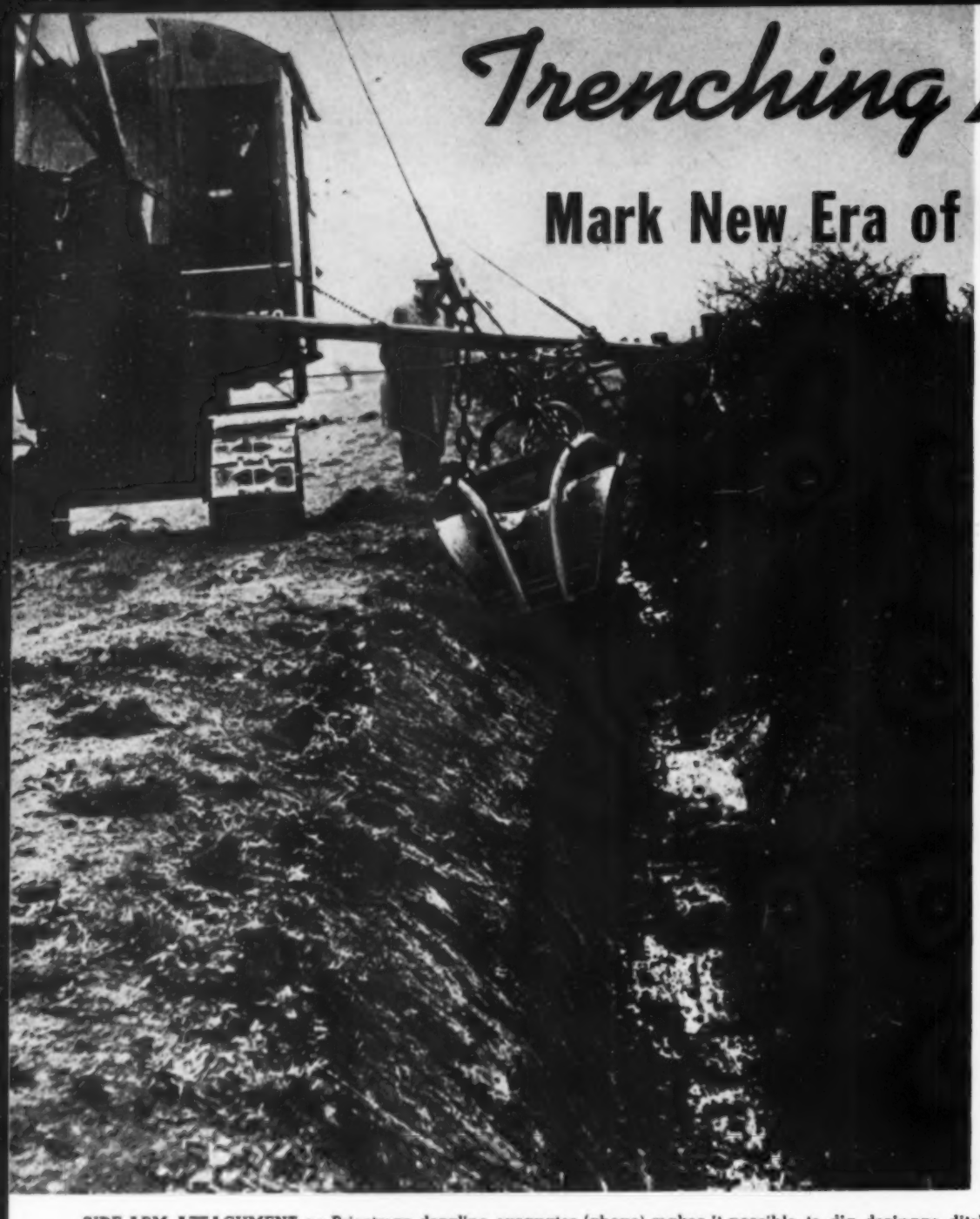
Trenching Machines

Mark New Era of Land Drainage

IN BRITAIN

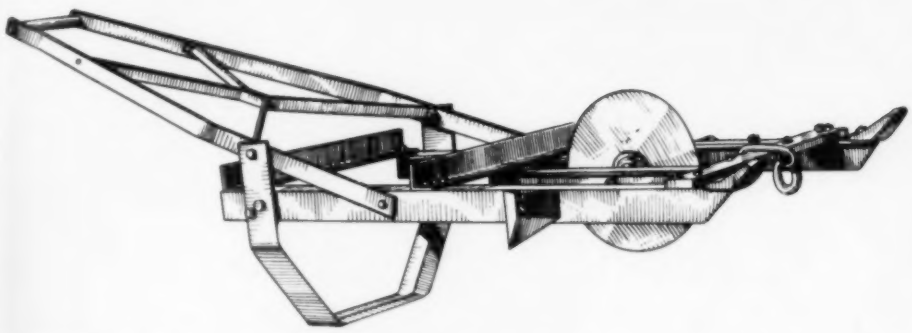
By E. A. G. JOHNSON

Land Drainage Division,
British Ministry of Agriculture



SIDE-ARM ATTACHMENT on Priestman dragline excavator (above) makes it possible to dig drainage ditches on offset lines close to hedges surrounding fields. SPECIAL BUCKET (right) is made in variety of bottom widths, with tapered sides to produce ditches of proper shape.

AMERICAN MADE EQUIPMENT (left and above) is represented by wheel-type Buckeye traction ditcher, supplied to Britain under Lend-Lease. Machine is mounted on rubber tires for rapid movement from one site to another. Alligator tracks (left) fitted over rear pairs of wheels spread load and improve traction.



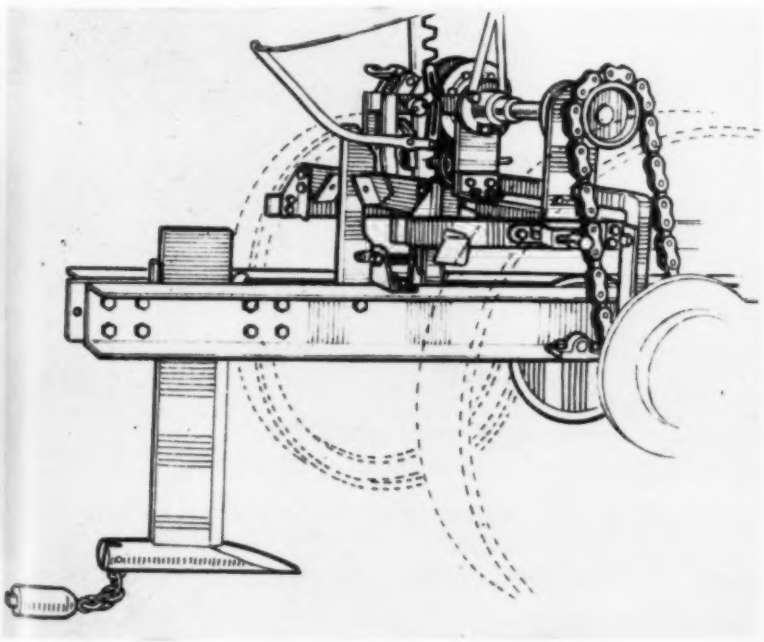
SIMPLE IMPLEMENT used by farmers is Kerry-Pratt all-steel ditch cutter, 8 ft. long and 2 ft. 9 in. wide, hauled by tractor. Standard cut of blade is 30 in. wide at top, 15 in. wide at bottom and 15 in. deep. Machine cuts sides and bottom of ditch to facilitate removal of earth with hand shovel.

ANYONE FAMILIAR with the English countryside in peace-time, and seeing it now for the first time since the war, would notice a vast change in the landscape. Field hedges which had grown to vast proportions between 1918 and 1939, have been cut back or grubbed-up, and the ditches which they covered have been dug out—in many cases for the first time for years.

This change in the appearance of the countryside marks a new era in the drainage of Britain's agricultural land. From about 1930 increasing attention has been given to the improvement of the main rivers, while, since 1937, drainage projects have been undertaken in organized local drainage districts. Although the improvement made by these works was considerable, their effect was mainly limited to the river valleys and flat fen and marsh areas.

Neither of these classes of work had any direct effect upon the drainage of the rolling "upland fields" which form such a large proportion of the available land in Britain. In these upland districts, a large proportion of the small farmers' ditches were, at the beginning of the war, choked or silted up, and underdrainage

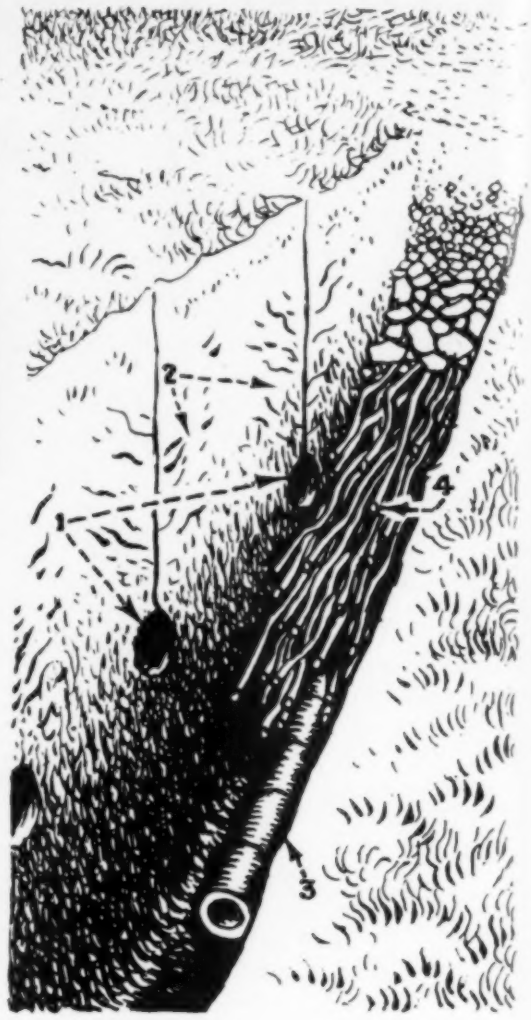
SUBSURFACE MOLE CHANNELS in clay soil (left) are formed by this Miles machine. Cartridge-shaped steel point at bottom of strong blade coulter (right) forms hole which is enlarged by "expander" trailed by short length of chain behind mole. Rack raises mole blade, when desired. Long horizontal beam carrying mole blade spans depressions in terrain and insures uniform gradient for drainage channel.



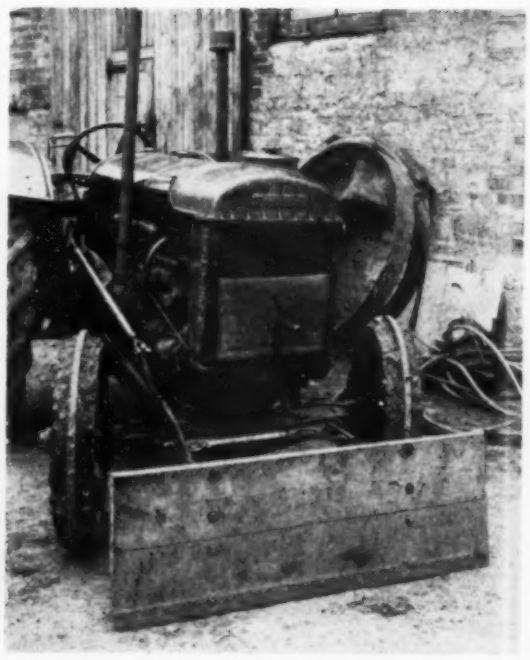
ANOTHER TYPE OF TRENCHER is the Henderson digger, equipped with "paddles" and powered by tractor through special gear box. Paddles spade up front of trench and scrapers clear spoil from digging blades.

INSPECTING BRITISH DRAINAGE PROJECT (left) are: HENRY N. LUEBCKE (at right), Soil Conservation Service, U. S. Department of Agriculture, who has been lent to the British Ministry of Agriculture; JESSE STANLEY, drainage officer of Lincolnshire (Holland) War Agricultural Executive Committee; and E. A. G. JOHNSON, drainage engineer, British Ministry of Agriculture and author of accompanying article.

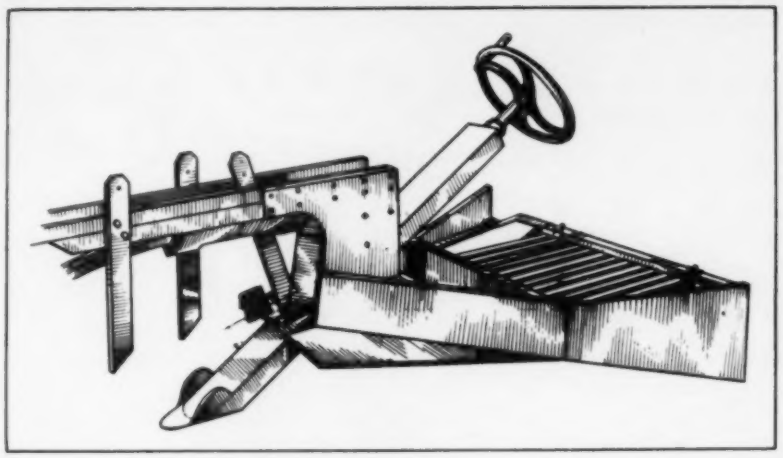
MOLE DRAINAGE SYSTEM (below) for heavy clay subsoil consists of laterals feeding into main ditch containing line of tile pipe covered with layer of brush and clinker. (1) Mole channels 24 in. deep are spaced from 9 to 15 ft. apart. (2) Fissures in clay are formed by heaving action of mole plow. (3) Tile pipe main, 4-in. diameter, is at depth of 3[illegible] in. (4) Layer of brush 12 in. enables moles to seep into tile main.

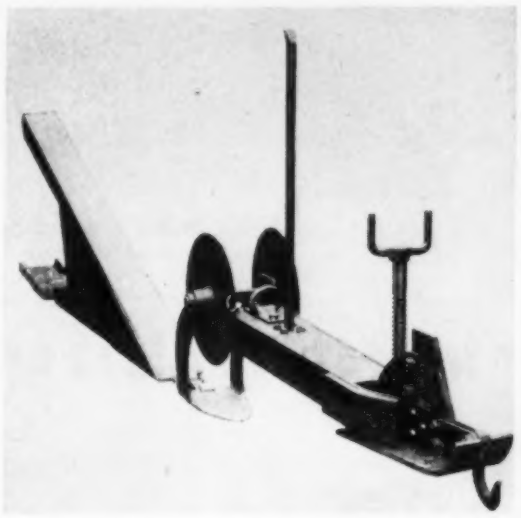


PIPE-LAYING ATTACHMENT (left and above) follows Roteho trencher. Bottom of device is shaped to sweep loose soil to sides of trench and to form groove into which tile pipe fit snugly.



HOMEMADE BULLDOZER BLADE mounted on Fordson tractor backfills tile drainage trenches.





FOR TRENCH EXCAVATION (above) this Manarson "delver" is equipped with worm wheel control for adjusting depth of cut up to 3 ft. Width of cut is 8 in. Operated by direct haulage or by cable from winch mounted on tractor.

CABLE FROM WINCH ON TRACTOR (left and right) pulls Gardner trench cutter, a unit of the plow type with disks that trim sides of trench.

systems, with their outfalls several feet below the level of the mud in the ditches, had little chance of functioning properly. It is probably no exaggeration to say that at least a quarter of the agricultural land in Britain was suffering from the neglect of ditches and drainage works.

The urgent need to drain this land quickly and to bring back its fertility, coupled with the shortage of labor, has given a great boost to the development and use of machinery. Dragline excavators and other plant had long been in use for the dredging of rivers and the larger watercourses, but field drainage works—the smaller ditches and tile drains—were still regarded as hand labor jobs. Large sums of money had been spent, especially during the years 1840-1880, in laying out extensive tile drainage systems. For this and other reasons it was obvious that the first work to be tackled should be the digging out of ditches to try to restore the effectiveness of the existing tile drainage systems.

An average field ditch in England is about 3 ft. deep, 18 in. wide at the bottom, and 5 ft. wide at the top. Except in the fens and marsh districts, nearly all the ditches are by the side of a hedge. Even the smallest of the dragline excavators available could not, when working in the usual manner, dig ditches of this small size.

The problem was solved by the introduction of what has come to be known as the side-arm attachment. This attachment, which is fitted either to the undercarriage or foot of the boom, usually the latter, of an ordinary dragline excavator, makes it possible to pull the bucket straight along the line of a ditch. Special buckets have been designed to work with these side-arm attachments and have tapered sides to cut the ditches to correct shape.

The side-arm-equipped dragline has done most of the machine ditching work to date, but a number of other ingenious, if not altogether successful machines, have been produced and tried. Some attempts have been made at ploughing out ditches, but these have only been partially successful. One extremely simple implement which is finding a good market among Britain's farmers is the Kerry-Pratt ditch-cutter, included among the illustrations.

Mole Drainage System

In the heavy clay areas of Britain a very popular and cheap method of draining is that known as mole draining or "plugging," as it is called in some counties. The essential feature of this system of draining is the use of a cartridge-shaped piece of steel of about 3- to 4-in. diameter which is drawn through the subsoil on the end of a strong blade coulter. This bullet or mole compresses the soil in

(Continued on page 142)

WHEEL TYPE TRENCHER (right) is this Roteho unit powered by Fordson tractor, here shown in traveling position. Depth of digging is adjustable by raising or lowering moldboard.

THREE PAVING MIXERS line up on this broad expanse of concrete pavement for air field apron. Two 27E pavers in foreground work together in placing 25-ft. lane, while single 34E dual-drum machine in right background operates alone on another lane.

U. S. Army Engineers Photo

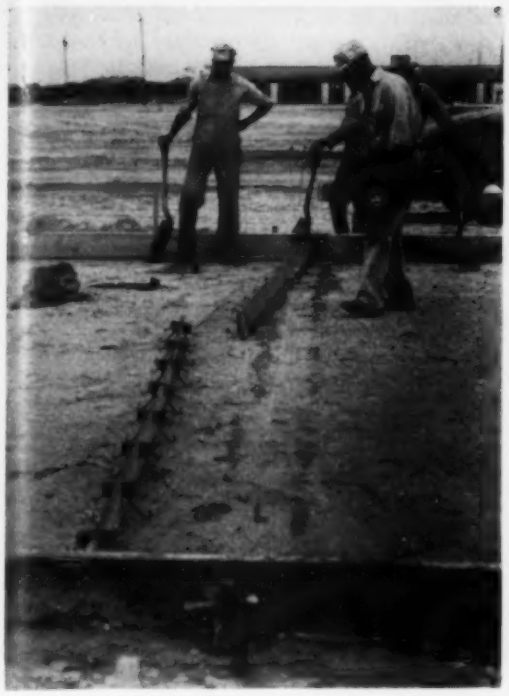
FOR EXCELLENCE IN CONSTRUCTION of Army air field, Austin Road Co. receives E pennant presented by Col. W. G. SAVILLE, district engineer, to TYREE L. BELL, vice president and general manager of contracting firm. In dark suit to right of Colonel Saville is MAX R. HOWARD, area engineer in charge of project for U. S. Engineers. Arrows point to R. W. (Rip) DIAL (left), project manager for Austin Road Co., and A. P. LITTLE, in charge for Harrison Engineering & Construction Corp.

U. S. Army Engineers Photo

Battery of Mobile Mixers *Speeds Concrete Paving* OF ARMY AIR FIELD

APPROACHING WOODEN BULKHEAD (below) at end of day's run, Jaeger-Lakewood two-screed finishing machine riding on steel forms strikes off concrete in 25-ft. lane. Concrete has average cement content of 5.3 sacks per cu.yd. and water content of 5.9 gal. per sack.

BY OPERATING four 27E single-drum pavers and one 34E dual-drum, with a fifth 27E in reverse, the Austin Road Co., prime contractor, Dallas, Tex., and the Harrison Engineering & Construction Co., paving subcontractor, Kansas City, Mo., placed 16,000 to 20,000 sq.yd. per 12- to 14-hr. day of non-reinforced concrete pavement in 25-ft. lanes of 9-6-9-in. and 7-5-7-in. section on a Gulf Coast air field for the U. S. Engineers, Galveston District. Laying pavement on practically level grades, the mixers were charged with batches of maximum permissible volume, 20 percent greater than rated capacity, 40.8 cu.ft. for the 34E and 32.4 cu.ft. for the 27E's. Batchmeters were



ON SANDY SUBGRADE of 25-ft. concrete paving lane, workmen install job-fabricated expansion joint units of California redwood with load-transmission lugs attached. Except for these lugs, non-reinforced pavement is devoid of steel.

PAIR OF 27E PAVERS traveling on two sides of paving lane cooperate in placing concrete between steel forms. Allowed 20 percent overload above rated capacity, these mixers handle 32.4-cu.ft. batches delivered to skips by truck.

set for 60-sec. mixing. Three batch plants, two on the site and one at a railroad siding near the property, supplied trucked batches of sand, gravel and bulk cement to the mixers. All these materials were shipped by rail to the siding.

Concrete paving in the Austin contract totaled nearly 1,000,000 sq.yd., most of it in 25-ft. lanes of 9-6-9-in. section for runways and aprons. Runways 6,000 ft. long and 150 ft. wide are flanked on both sides by 100-ft. shoulders. Much of the shoulder construction is concrete pavement of 7-5-7-in. section, but a large portion is stabilized sand-shell mixture compacted to 10-in. thickness, with single asphalt surface treatment. Sand-shell mixture was produced by a 5,000-lb. pug-mill mixer on the job. An original estimated quantity of 240,000 sq.yd. of stabilized shoulder was somewhat increased during construction of the project.

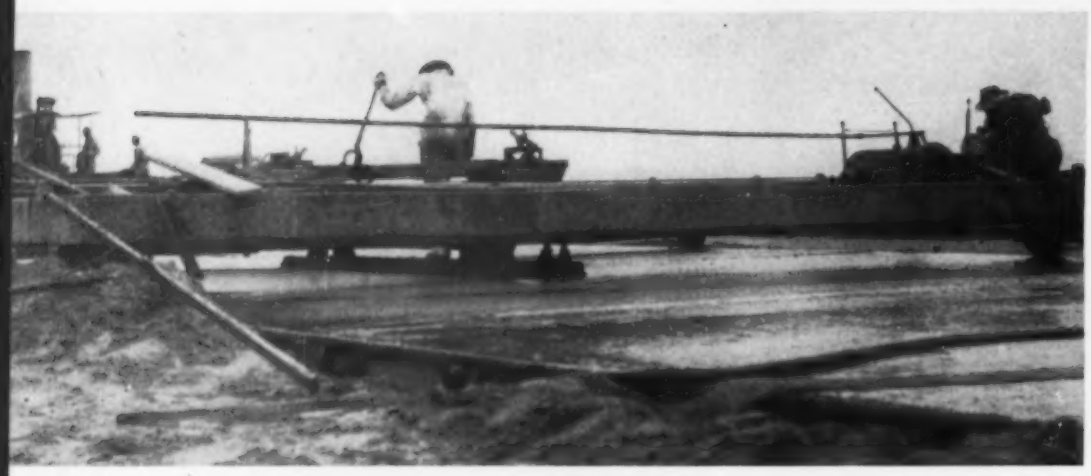
Pavement Design

Pavement was laid on hydraulic fill subgrade averaging 92 percent sand, with 8 percent silt and clay. The sand is about 40 percent fine, passing a 40-mesh sieve. Dry weight of subgrade soil samples ranged from 99 to 108 lb. per cu.ft., with most of them close to 100 lb. Supporting value of the confined sandy soil was determined by cutting holes in runway pavement of a municipal airport which formerly occupied part of the site and making tests with 30-in. bearing plates. Test results were used as a basis for design, by the Westergaard formula, of concrete pavement to take a 60,000-lb. wheel load (120,000-lb. plane load).

Except for Star load-transmission lugs at transverse expansion joints 120 ft. apart, no steel was used in the concrete

TANK TRAILER drawn by paver is equipped with pump to furnish mixing water. Trailer is being filled by hose from tank truck on far side. Note welded keyway on steel form to make keyed construction joint between lanes. No dowels or reinforcing steel are used in pavement. Wooden bulkhead in place on subgrade marks end of day's run.

JOINT MACHINE (below) traveling on forms cuts center-line contraction joint in concrete and installs ribbon-type filler. Manually controlled reciprocating blades on same machine cut slots for transverse contraction joints, which are filled by hand with strips of premolded material.

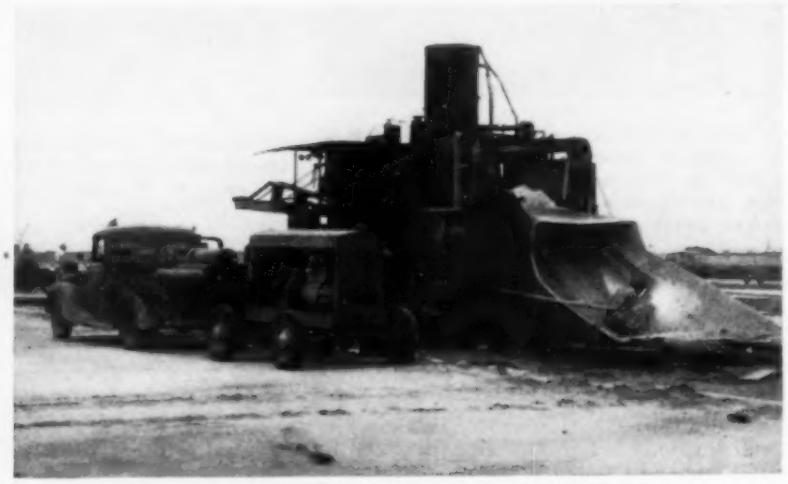


MECHANICAL FLOAT operates with two motions, longitudinal and transverse, while machine moves forward slowly, thus smoothing out high spots and depressions in longitudinal direction.

pavement. California redwood was employed to the extent of its availability in the expansion joints, ¾ in. thick, with premolded asphalt-impregnated fiber filler substituted where necessary. The same filler materials were installed in longitudinal expansion joints of ¾-in. thickness, without dowels, on center lines of runways and at 100-ft. spacing in aprons. Dummy contraction joints were cut in the fresh concrete on the center lines of 25-ft. lanes and transversely at 15-ft. intervals between expansion joints. Premolded filler of ribbon type was placed by machine in the center-line contraction joint.

When placing 20,000 cu.yd. in a 14-hr. day, including time consumed by moves or other delays, the five operating pavers

AFTER BELTING SLAB, hand finishers edge transverse joints from rolling bridge. Transverse contraction joints are installed on 15-ft. centers between expansion joints 120 ft. apart.



AT END OF DAY, portable G-E welding set is wheeled up to 34E dual-drum mixer to rebuild worn spots in skip.

MOTOR GRADER strikes off excess subgrade material for removal from between forms.

PNEUMATIC-TIRED ROLLER (below) drawn by farm tractor compacts subgrade for runway pavement.

had to average about 250 cu.yd. of concrete per hr. With the 34E dual-drum mixer averaging 52 batches (78.5 cu.yd.), the four 27E's had to maintain an average throughout the day of 143 batches (171.5 cu.yd.) per hr. One batch plant on the site furnished materials to the 34E; the other two plants supplied batches for the 27E's.

All the pavers on the job were Koehring machines. Two 27E's ordinarily worked in combination, traveling opposite each other, outside the two edges of the lane being paved. Mixing water was furnished by tank trailers hooked to the pavers and equipped with pumps. Tank trucks filled the trailers.

Behind the pavers, a two-screed finishing machine struck off the concrete, and a Flex-Plane joint machine cut the contraction joints and installed the center-line ribbon filler. Following these machines, a Koehring mechanical longitudinal float ironed out irregularities in the longitudinal direction. Hand finishers belted and straight-edged the surface and completed the edging of the joints.

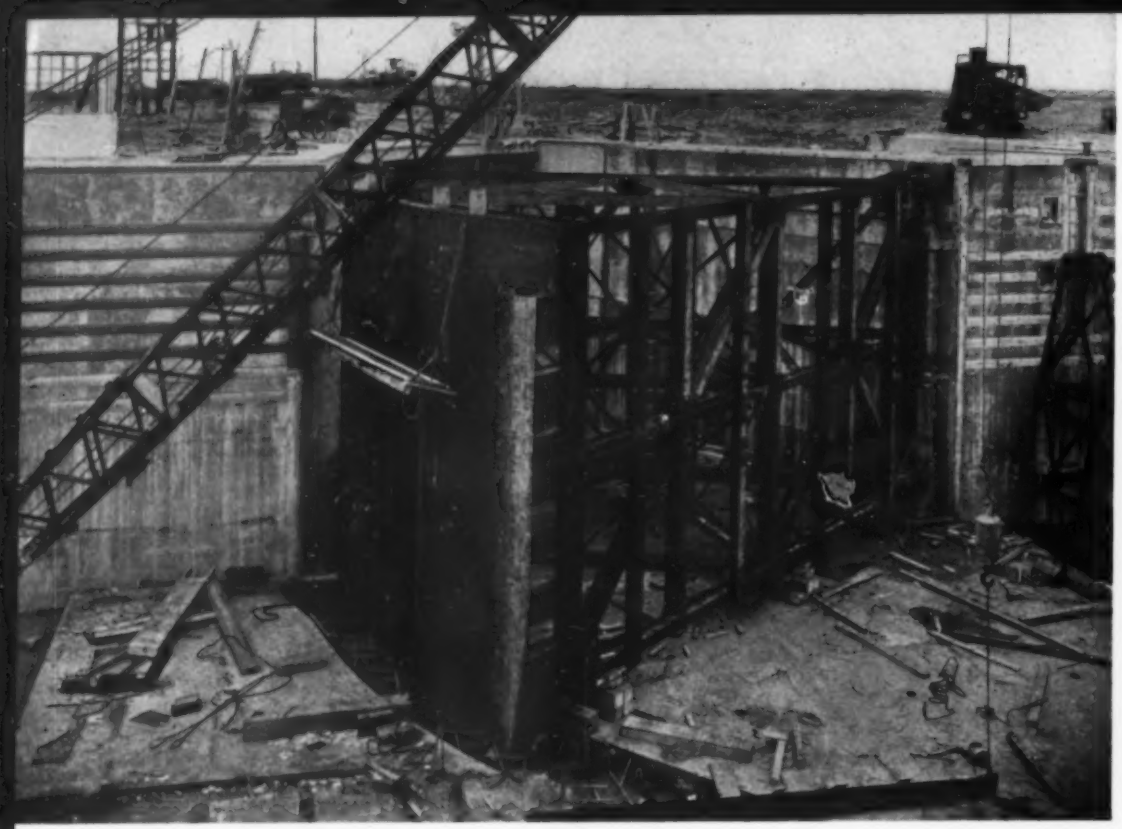
Runways and aprons were cured with sprayed transparent membrane. To provide a distinguishing color, the concrete

(Continued on page 150)

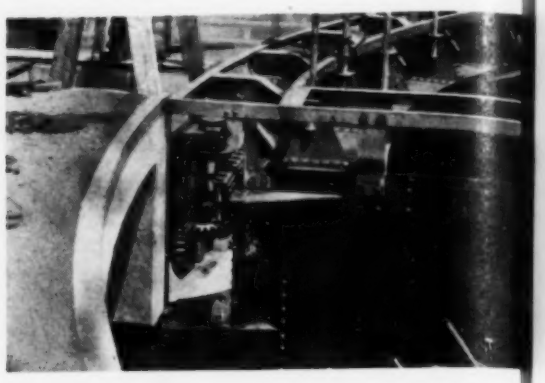
ROAD BUILDERS' *Pin-up Girl*

ENGINEERING EYEFULL in service of Alabama State Highway Department, MISS FRANCES LINDSEY, junior aide on planning survey, suggests the query "How would you like to be chief of this party?" While her work consists principally of drafting and tracing maps in the department's headquarters office in Montgomery, she is here pictured "on location," with a transit,—which you may not have noticed up to now—furnishing surveying background. B. C. Goode, senior civil engineer, tells us that this photograph was made by Franklin Collier, of one of the division offices, who "has given a good bit of his off-time to the making of pictures for the highway department's news bulletin." Time well spent, we'll say!

Construction Methods hereby nominates Miss Lindsey as Road Builders' PIN-UP GIRL. Is there any competition?



SUPPORTED BY TEMPORARY BLOCKING (left), gate is assembled complete, pinned and bolted ready for riveting. Operator's house is on top of lock wall at left; paving mixer used for concreting is at right.



TOOTHED SPROCKET engaging roller rack on face of gate moves gate either way to open or close channel for navigation purposes.

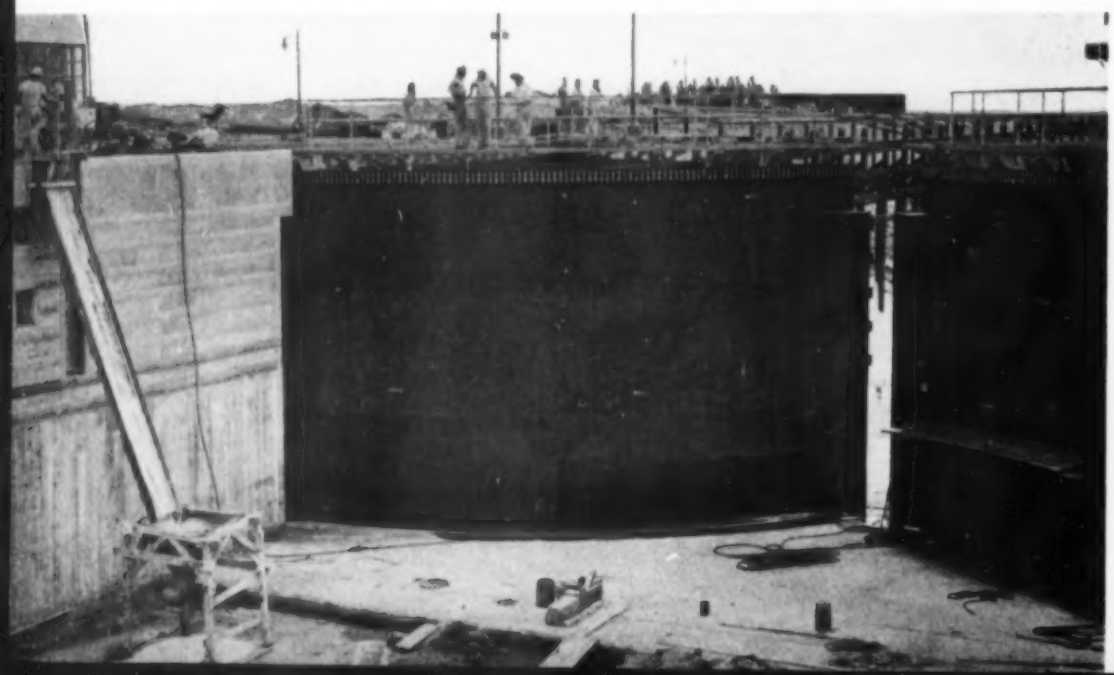
Sector Floodgates

STOP SILTING OF NAVIGATION CANAL

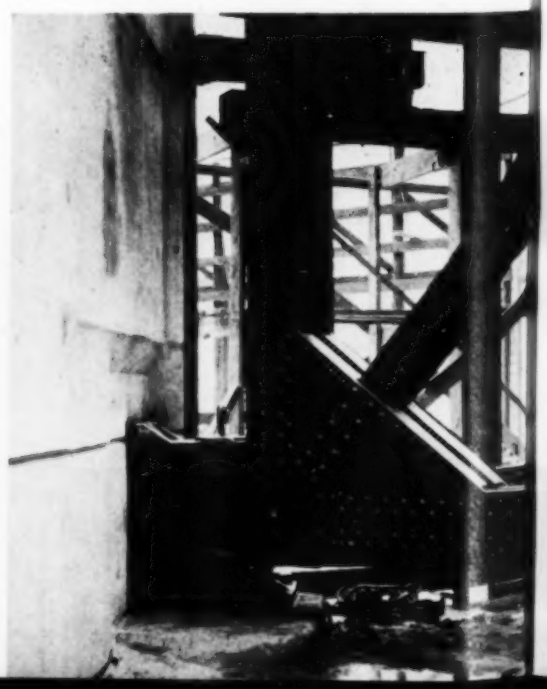
TO PROTECT DREDGED CANALS of the Intracoastal Waterway against silting by backed-up floodwaters at two crossings of Texas rivers, the U. S. Engineers are installing in relocated approaches on both sides of the rivers floodgate structures incorporating sector gates of a type introduced into the United States some years ago by the Engineer Corps. At one river crossing, the Tellepsen Construction Co., Houston, Tex., is completing under a $1,700,000 contract two such floodgate structures on both sides of the river about 1,000 ft. back from the banks. Four crawler-mounted rigs operating at various times as draglines, piledrivers and cranes have rendered important service during every stage of construction. Following completion of the floodgates, dredges of the U. S. Engineer Department will cut new approach channels connecting the existing canals with the river via the floodgate structures.

Sector Gates—Sector gates are radical-

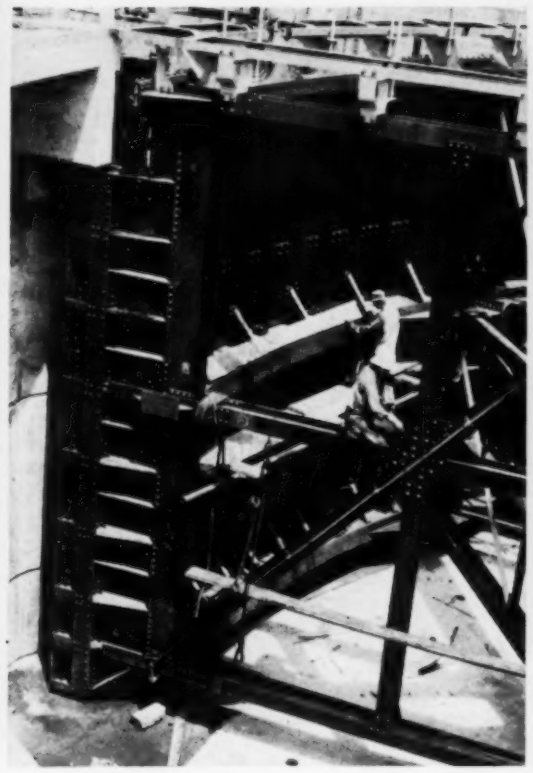
TO CLOSE CHANNEL (below), two sector gates turning on hinges are moved outward by power sprockets engaging roller racks to be seen near tops of skin plates.



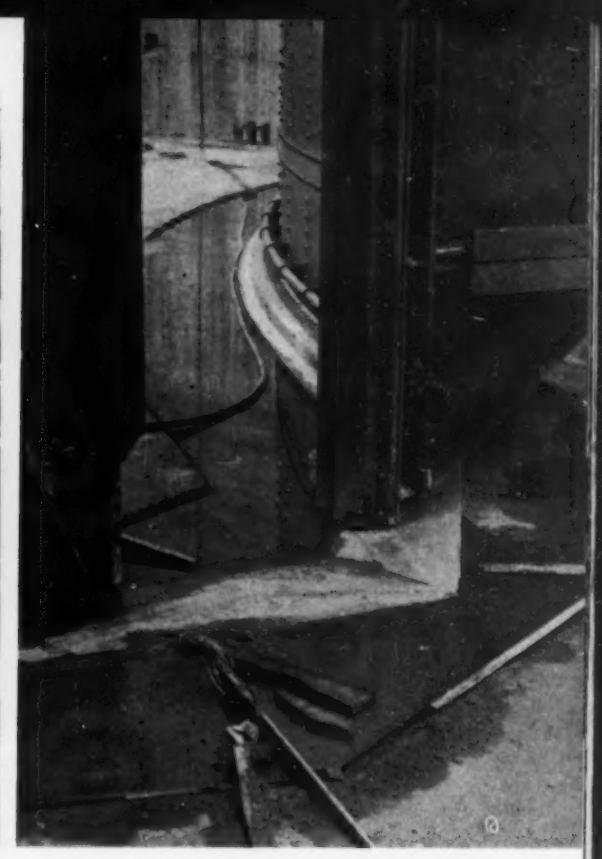
LOWER HINGE of 70-ton gate turns on 12-in.-dia. forged steel pin. Zinc rings at top and bottom of lower hinge absorb effects of electrolysis in salt water and prevent eating away of steel.



RUBBER GASKET at bottom of gate makes contact with stainless steel strip on sill. Pipe on gate is perforated to throw pressure spray for cleaning silt from sill. When gate is fully closed, vertical edge gasket will make tight seal with concrete wall in background.



WITH FACES PROTECTED by zinc ointment, painters brush creosote coating on steelwork of sector gate. At upper left is bevel gear which drives sprocket for moving gate.



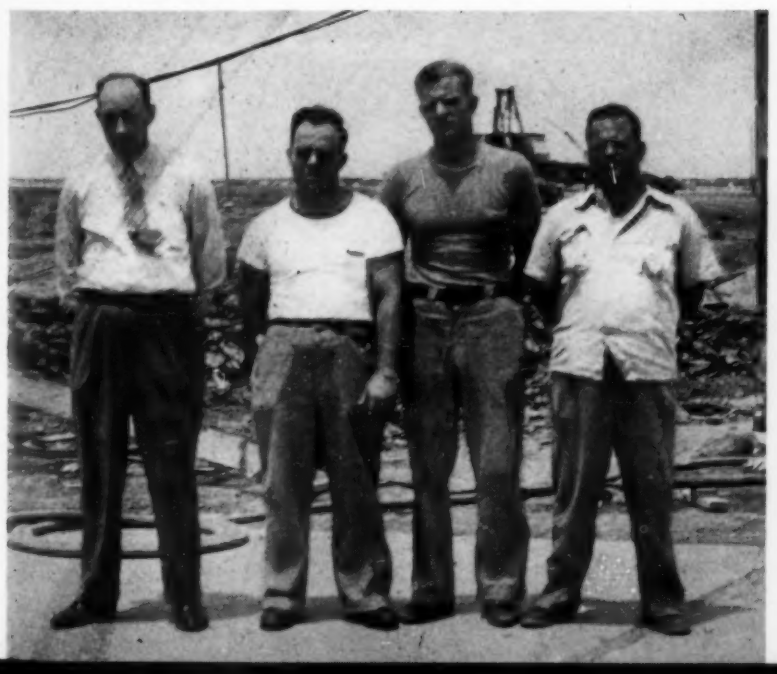
STAINLESS STEEL STRIP on concrete sill provides smooth contact surface for bottom rubber gasket on gate. When two gates meet, rubber edge gaskets come together to form tight seal.

ly different from the miter type commonly used in navigation locks in the United States. As aptly described by the men in charge of the project, a sector gate is like a tainter gate turned on end to swing horizontally instead of vertically. In plain view, as looked at from above, a sector gate comprises two radial arms extending outward from the hinge, at the center of rotation, to a curved beam backing up the skin plate, which conforms to the arc of a circle. As seen in elevation, from the side, the skin plate is vertical and is supported by a trussed steel frame (comprising three horizontal tiers), which swings on two hinges. Accompanying photographs clarify these details.

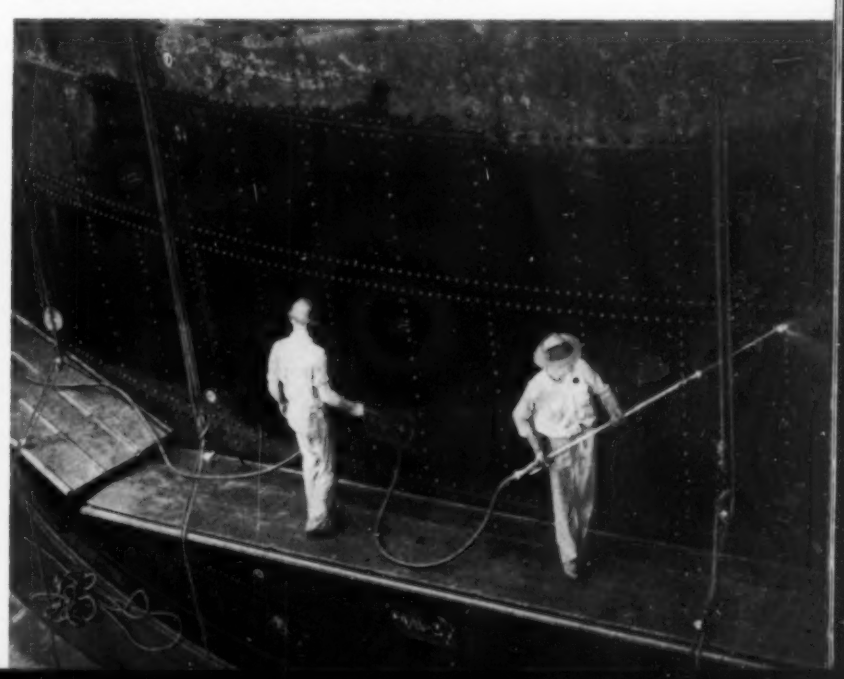
A floodgate unit includes two sector gates hung at opposite sides of the channel, 75 ft. wide between armored concrete walls. To clear the channel for navigation, the two gates are retracted into bays in the side walls. After traffic has passed, the gates are rotated outward until they meet at the center of the chamber. Each gate is moved by an electric-motor-driven sprocket at the top of the lock wall; this sprocket engages a roller rack riveted to the face of the gate near the top of the skin plate. In normal opening and closing, the movements of the two gates are synchronized.

Convex surfaces of the two gates face toward the river, to resist floods. The gates normally are kept in closed position, to be opened only for passage of waterway traffic. Selsyn stage-differential speed-control apparatus automatically regulates the rate of opening the gates. A float in a stilling well in the lock wall governs the speed-control equipment. With the water level at the same stage on both sides of the gates, they open at maximum speed, 20.56 lin.-

FLOODGATE INSPECTION (below) brings together: (left to right) **HERMAN R. HORN**, engineer, U. S. Engineers, Galveston District; **EDWARD POLLAK**, office engineer; **HAROLD E. WIBYE**, assistant superintendent, Tellepsen Construction Co.; and **GEORGE W. AVERY**, project engineer.



PRESSURE SPRAY (below) tests skin plate rivets and welded joints for possible leakage before operation of sector gates.



EQUIPPED AS DRAGLINES, versatile cranes excavate silty clay at site of floodgate structure and load spoil into tractor-drawn crawler wagons.

CUTOFF WALL of steel sheetpiles 30 ft. long is driven by crane operating drop hammer in swinging leads.

BUCKET (left), hung on load line of crane, transports concrete into reinforced sill beam 5 ft. thick resting on piles.

ft. per min., requiring 2½ min. for full opening.

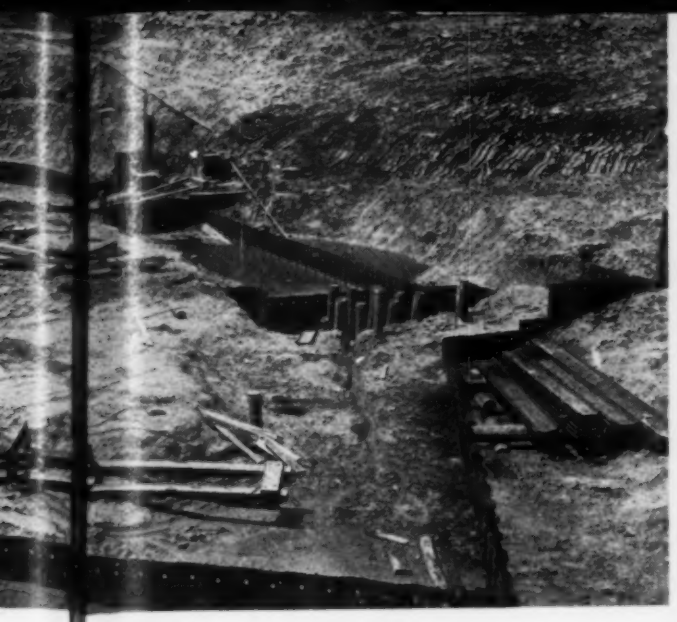
Each gate includes a 60-deg. sector of 43-ft. 3-in. radius. Based on mean low Gulf tide, the lock floor is at El. —12, and the top of the lock wall is El. 12. Maximum lunar tide does not exceed 2 ft., although winds sometimes cause higher tides. The gates can take care of a flood of about 10 ft. above low tide.

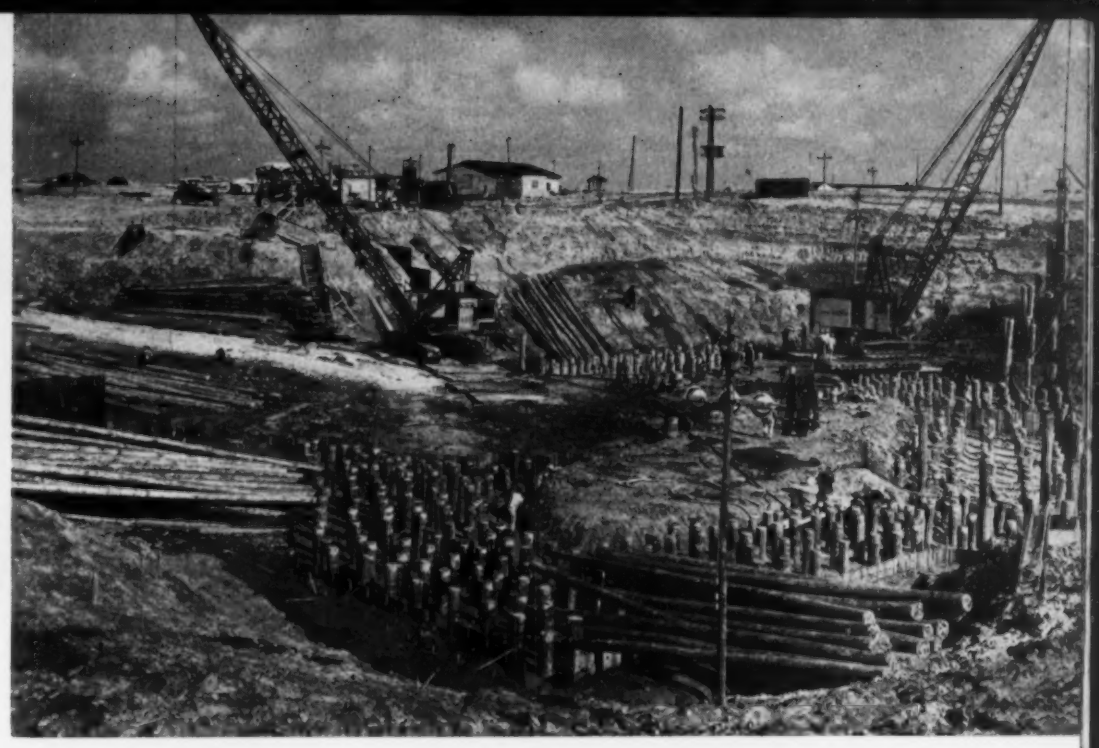
Structural steel in the riveted frame of each sector gate weighs about 70 tons. The skin plate is riveted to the curved horizontal beams and vertical steel studs on the face of the frame, and joints between sections of skin plate are welded. At the center of rotation, the gate swings on a pair of hinges. The lower hinge turns on a 12-in.-dia. forged steel pin. Under the bottom of this hinge are three thrust washers: (1) bronze, (2) steel and (3) bronze. Zinc rings are installed

(Continued on page 158)

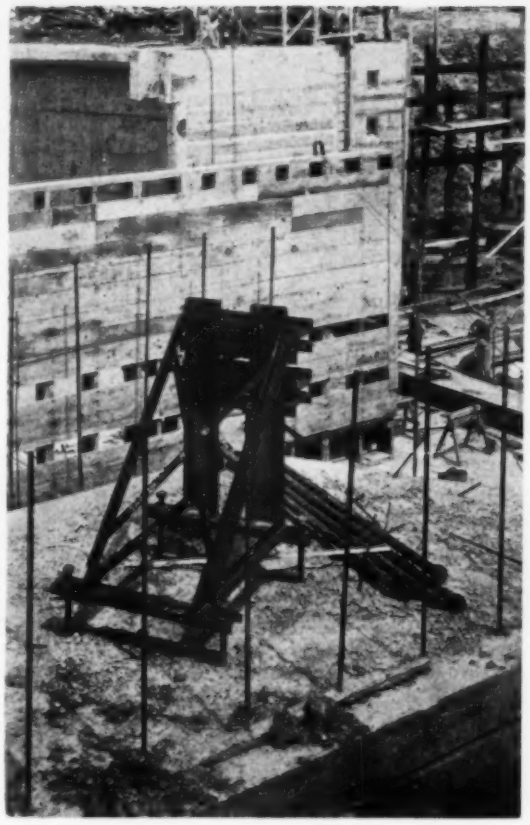
REINFORCED-CONCRETE WALL (below) of floodgate structure is recessed to provide bay for sector gate. Curved trench has been left open in floor concrete for placing gate sill to accurate grade. At right, workmen are installing asbestos-cement electrical conduit connecting control house on top of lock wall with gate operating machinery on opposite side of channel. Anchor seats for Poiree dam may be seen at left.

STEEL-FRAME SUPPORTS (below) for Poiree dam are erected on sill seats in test installation. Bulkhead sections of dam are set against these frames.





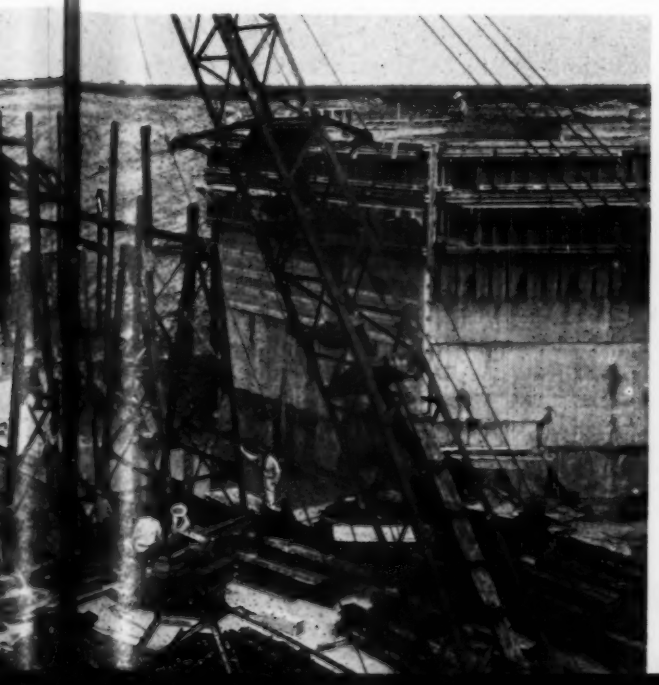
HEAVY-DUTY CRANES, operating drop hammers in swinging leads, set and drive timber foundation piles for walls and sills of floodgate structure.

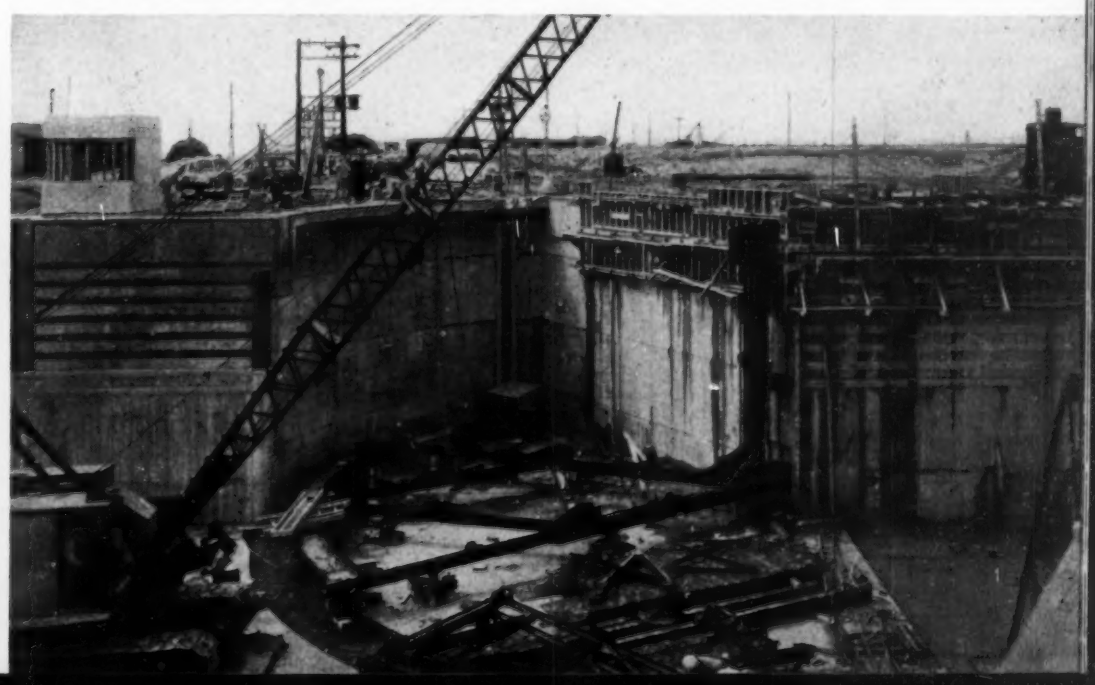


TOP HINGE ANCHOR (left) is set in position to be buried in concrete. Anchor bolts lying on concrete will be attached to steel frame.

NON - LOAD - BEARING FLOOR (right) is placed in blocks 2 ft. thick equipped with weep holes to relieve water pressure when gate structure is pumped out inside Poiree dams.

WITH CRANE HANDLING STEEL (below), structural ironworkers assemble first tier of framing for sector gate. Radial arms of frame extend outward to curved face beam from vertical hinge posts previously set in place on hinges.

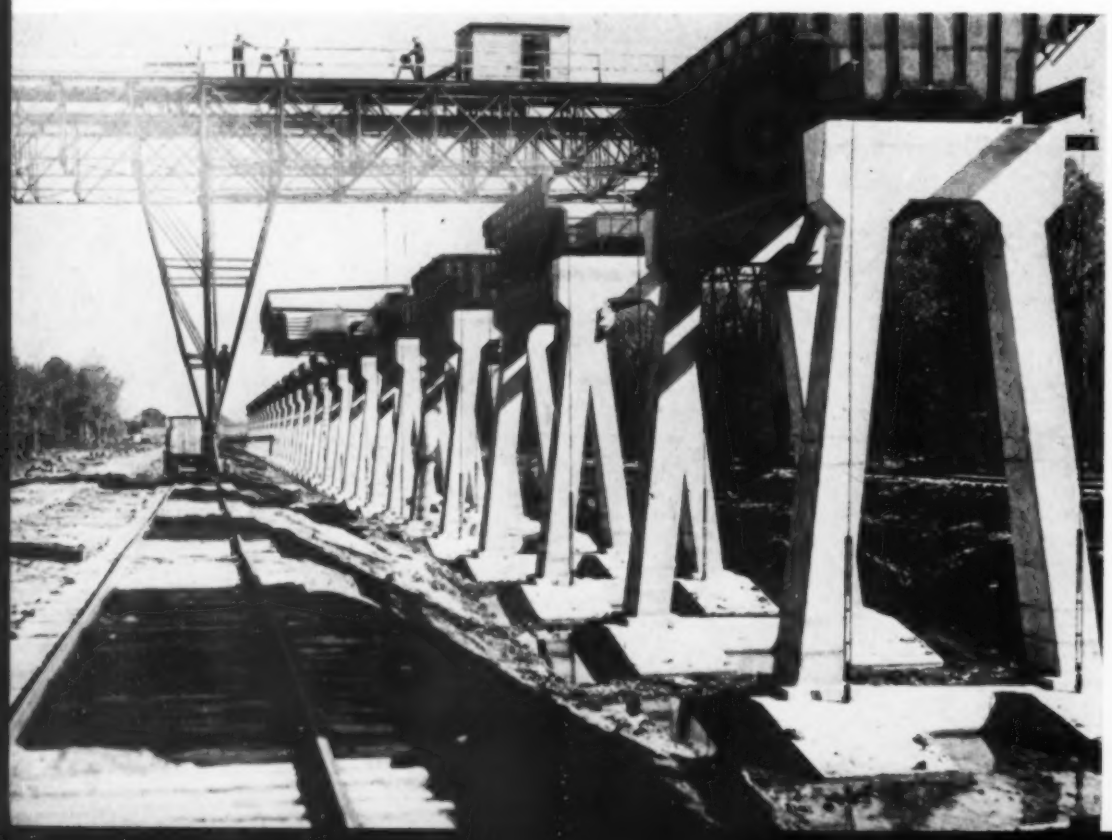




STRADDLING LINE of TRESTLE self-propelled gantry moving on standard gage tracks 75 ft. apart lowers bucket of concrete for footing of 3½-mi.-long railway trestle across floodway.

Long A-Frame Trestle Concreted From

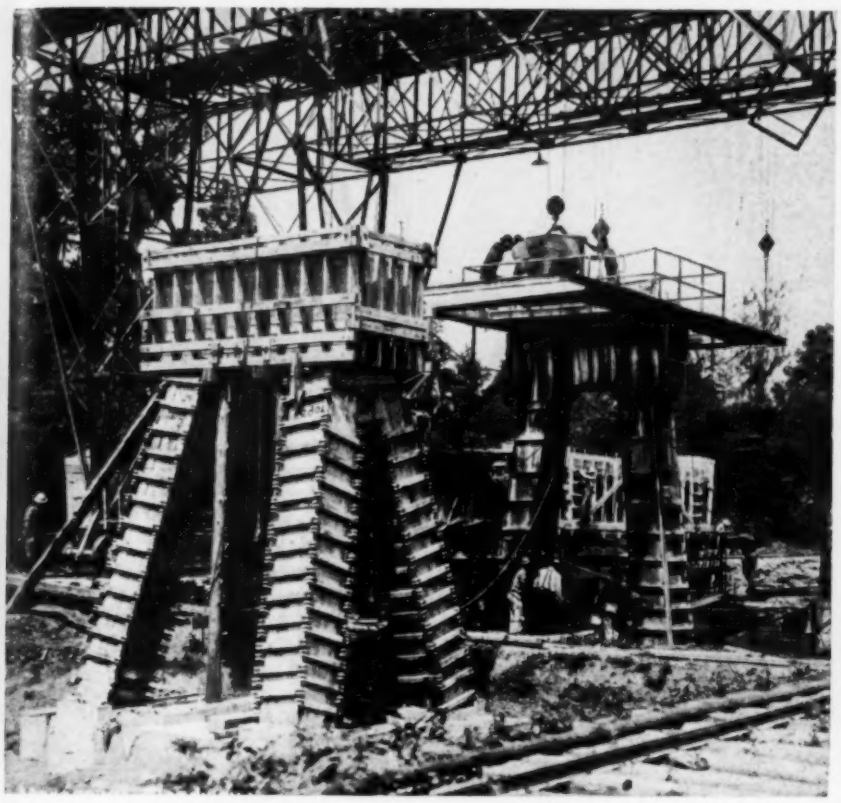
GANTRY MOVES steel deck form (below) to new location. Cantilever beams with adjusting tierods extending to footings support main form.



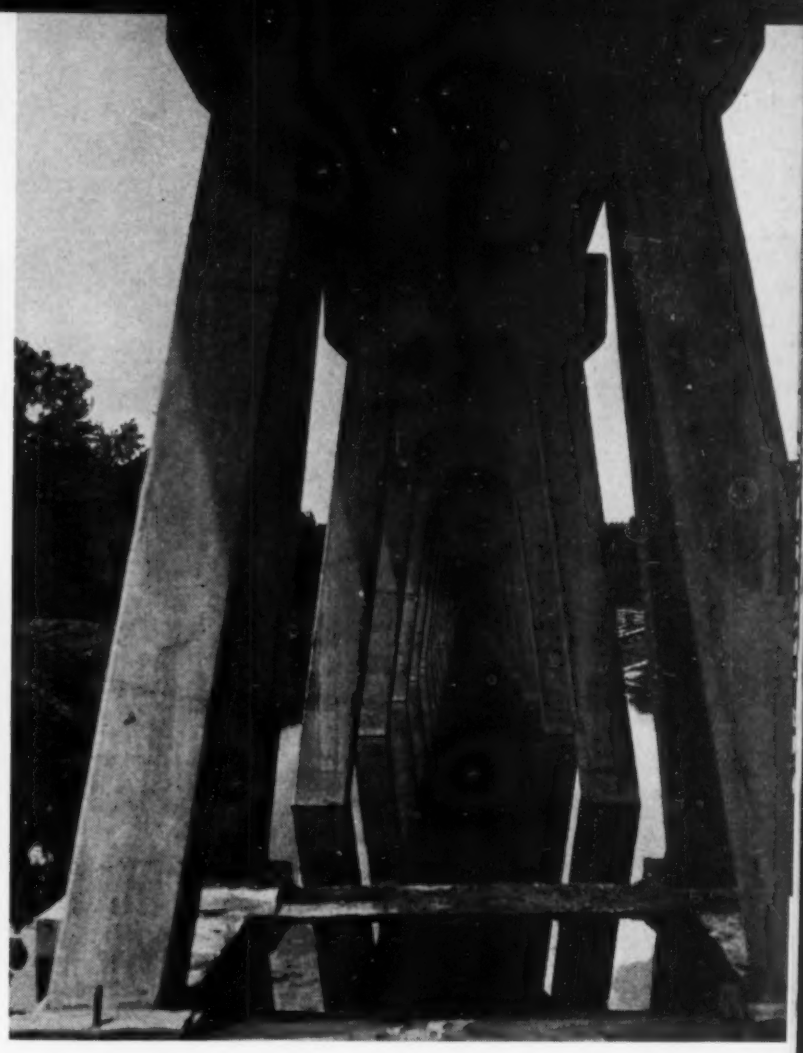
WELL ABOVE THE REACH of predictable high water in a floodway built to divert part of the flow of the lower Mississippi River, a new concrete trestle 3½ mi. long carries an important single-track railroad serving a region of the Deep South. Built for the railroad by Brown & Root, Inc., of Houston, Tex., and supervised by the U. S. Army Engineers, the structure consists of reinforced T-beam simple spans on reinforced concrete open piers, spaced 31 ft. 3 in. c. to c. The main trestle has 600 of these spans and about a mile east is a short trestle with 10 spans.

The typical bents are reinforced concrete A-frames set at right angles to the centerline of track, and the anchor bents consist of double A-frames set parallel with the track. Most of the typical bents in the main trestle are each supported on 24 untreated timber piles. Anchor bents, abutment bents and those adjacent to them, as well as bents where the line crosses old borrow pits and small streams, are carried on Monotube metal-incased, cast-in-place concrete piles.

FROM MOVING BRIDGE (below) carrying suspended platform, concrete is deposited into steel forms for typical interior A-frame bent. At left, wood forms are used for anchor bent.



TYPICAL TRESTLE BENTS (right) for 3½-mi. floodway crossing by railroad are concrete A-frames supported by clusters of 12 piles under each leg.



Photos, Portland Cement Assoc.

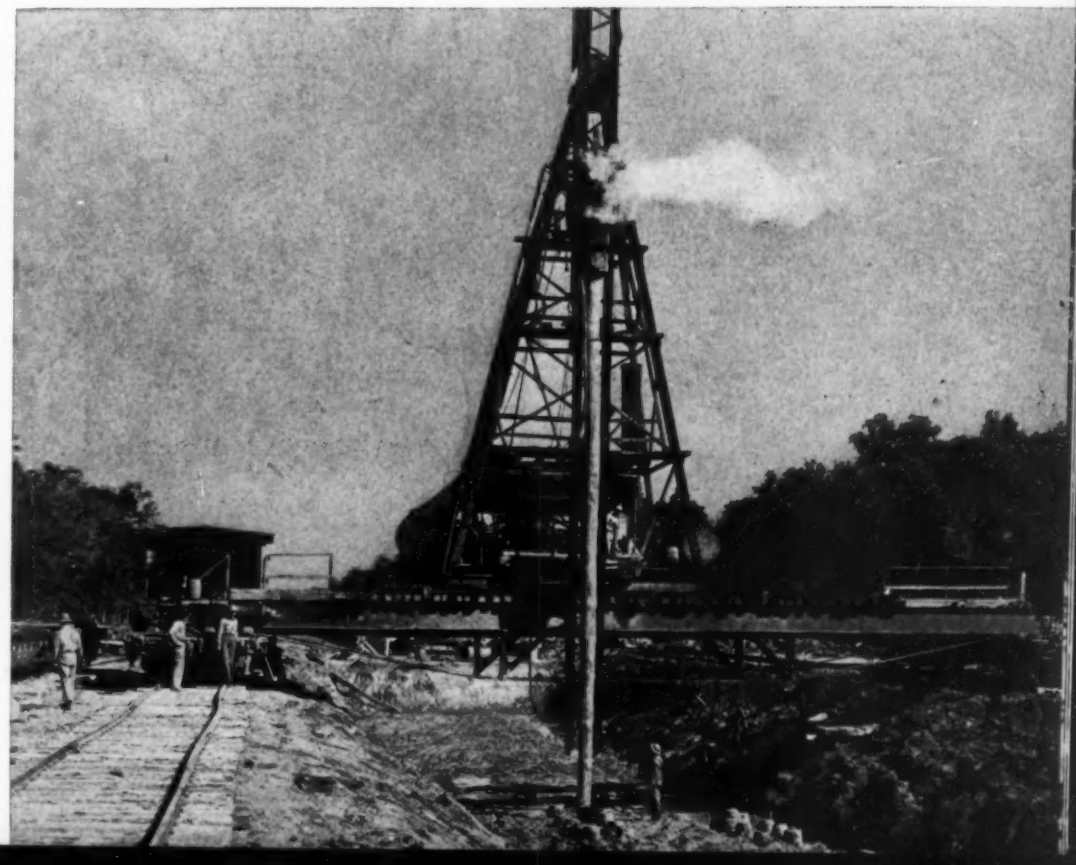
Mobile Overhead Plant Straddling Line of Work

As much construction as possible was handled from self-propelled overhead bridges and gantries straddling the site and traveling on tracks along each side. A continuous trench the length of the trestle and wide enough to permit setting side forms for the footings, with its bottom at the elevation of the bottom of footings, was dug with a 2-cu.yd. dragline bucket. The excavated earth was piled along each side to form embankments to carry standard railway tracks. One track was on the south side and two on the north side. Overhead gantries, supported on standard railway tracks, were operated on the south track and inside north track, which were 75 ft. c. to c. The outer north track handled materials and equipment.

Difficulties encountered in the early stages of the work in holding the construction track in line were solved by depositing a mixture of sand and gravel with 1 sack of portland cement per cu. yd. on the track in sufficient quantity to raise

(Continued on page 136)

PILE IS DRIVEN by 50-C Vulcan hammer (below) with 5,000-lb. ram striking 120 blows per min. Self-propelled driver tower is mounted on bridge formed by steel girders carrying standard-gage track.



TIMBER BLIMP DOCK ARCHES

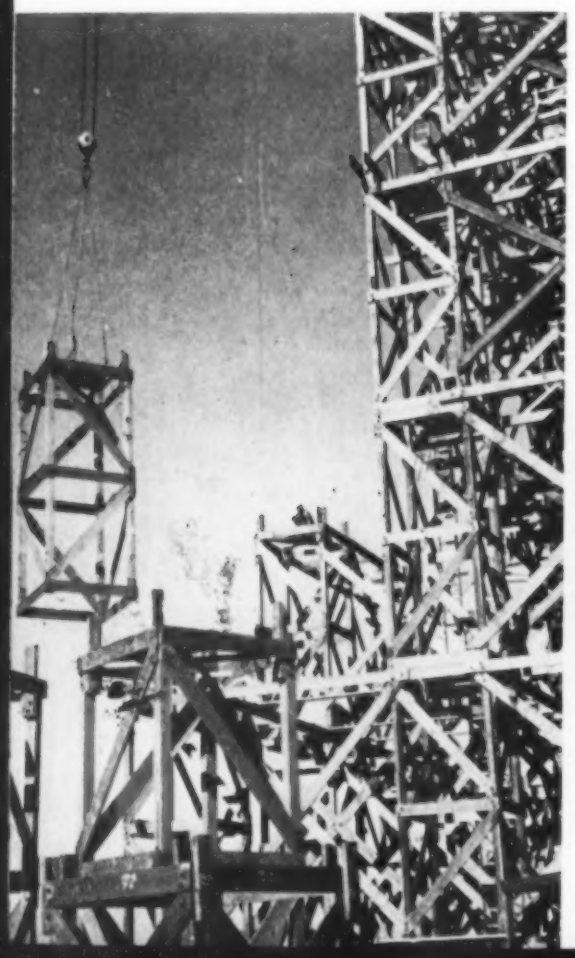
Erected From Traveler SET SPEED RECORD

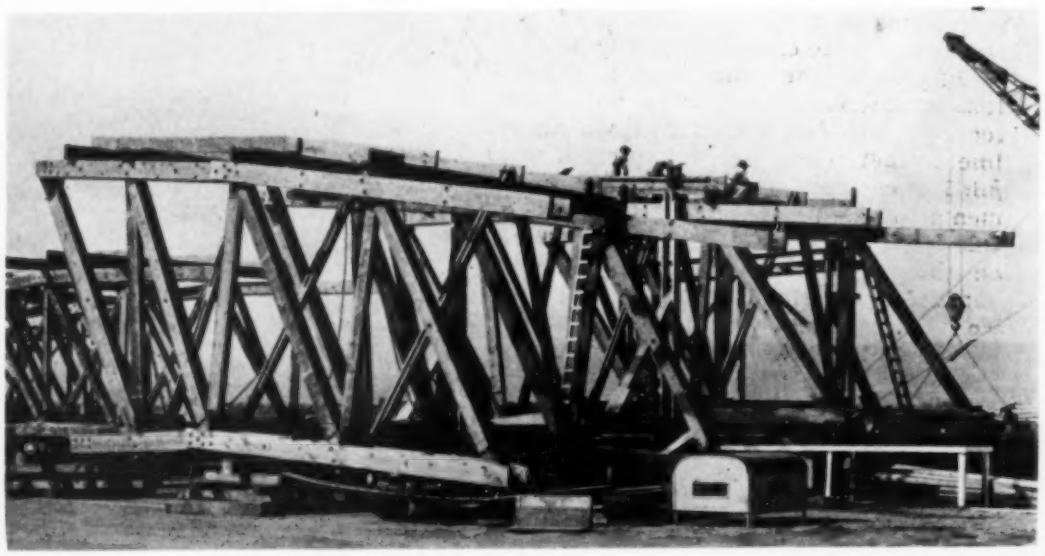
MOUNTING TWO STIFF-LEG DERRICKS with 100-ft. booms, big traveler is ready to start operations in erecting 51 timber arches of 237-ft. span. First or cantilever section of arch rib on each side was lifted to place by crawler crane on ground.

SETTING A NEW SPEED RECORD for timber blimp dock erection, the arch barrel of one of these large structures, involving 1,700,000,000 ft. b.m. of lumber, was completed at the Navy's Moffett Field in California in 156 working hours. Credit for this feat belongs to the organization and teamwork of the crews of J. H. Pomeroy & Co., Inc., contractor for the job. It was made possible by use of a two-derrick traveler weighing 700 tons which lifted arch segments two ribs wide.

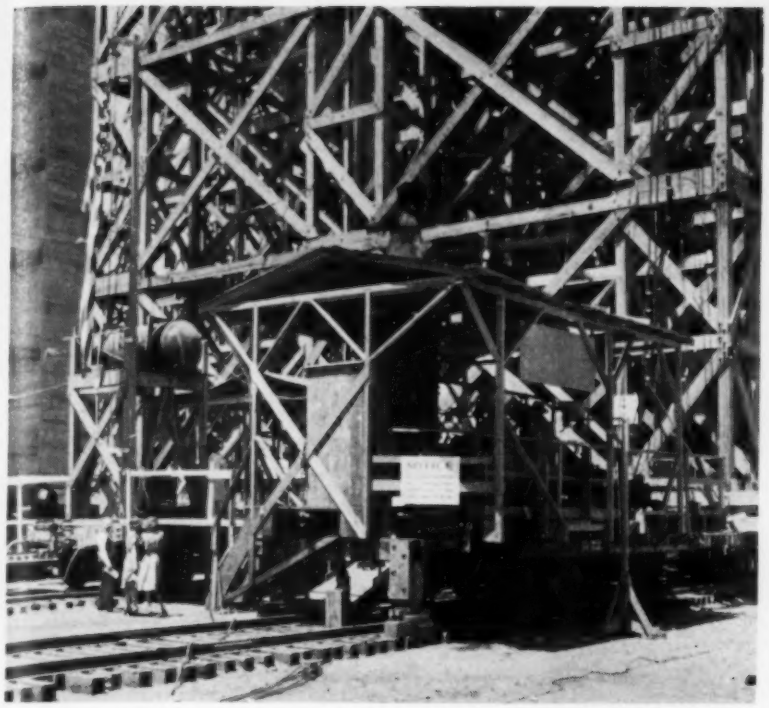
The traveler design, based on patents developed by the contractor on previous jobs, had a frame of great rigidity. Its units, well braced rectangles whose principal members were 10x10s and 12x12s 22 ft. long, were assembled on railroad flat-cars and trucks grouped on railroad tracks in such a way that a truck was directly underneath each tower unit. In addition to a working platform at the crown of the arch, there were nine levels on either side at heights convenient for making all field joints and at other locations where considerable work had to be done. Eight-ton hydraulic jacks were located at two points on the crown plat-

STRENGTH AND SPEED of erection in traveler (below) are centered in units of which it is built—8x8-ft. sections, 22 ft. high, made up of 10x10s and 12x12 timbers. These units are so handy that J. H. Pomeroy & Co., Inc., has patented design.

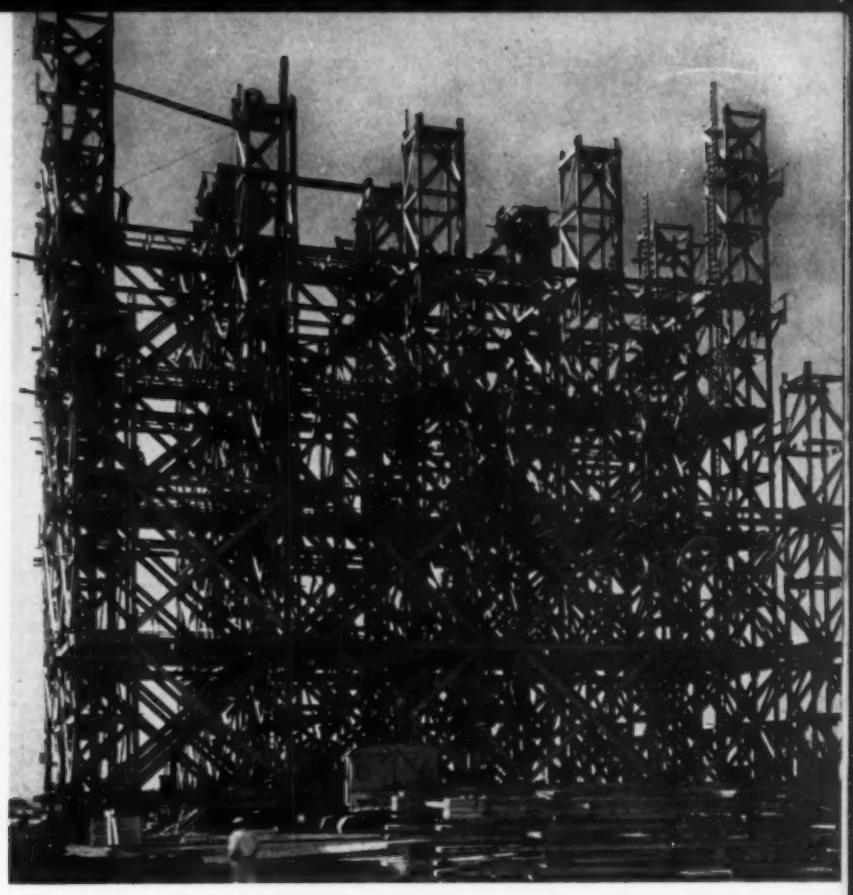




SECTIONS OF ARCH, two ribs wide, are made up on jigs and stored until needed by assembly crews. Each arch went up in five sections.



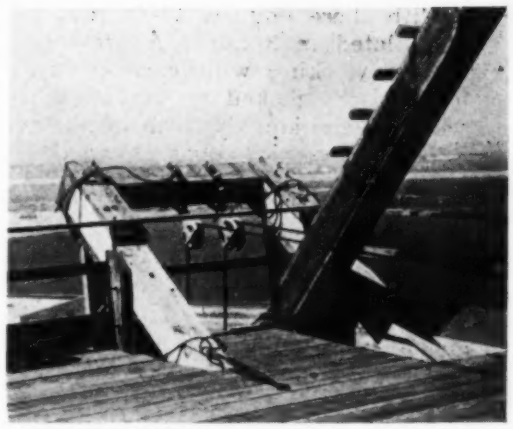
POWER FOR OPERATING two derricks is supplied by steam donkey engines mounted on flatcars attached to rigid horizontal framing of traveler at flatcar level. Flatcars are part of traveler base.



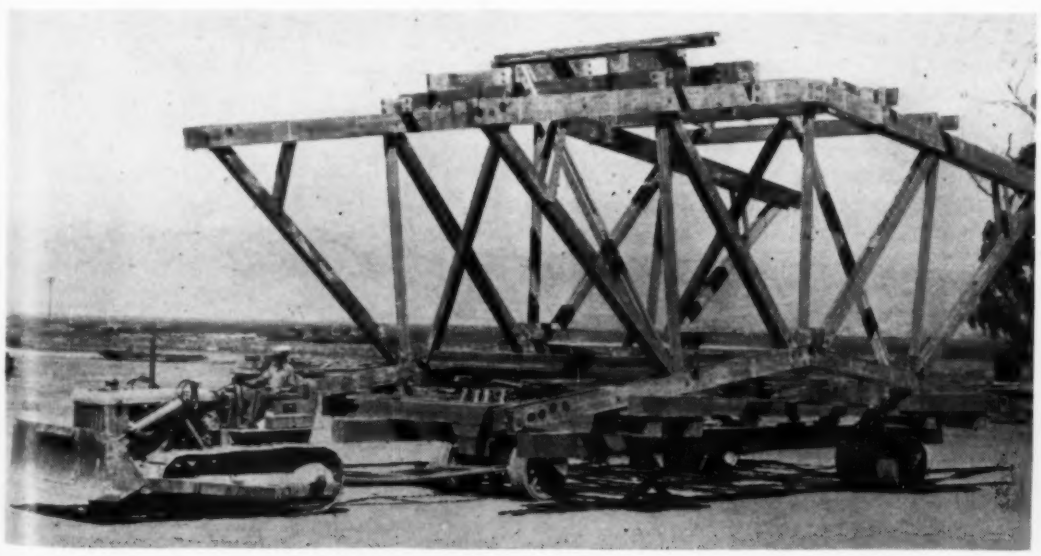
TRAVELER IS BUILT with units assembled in form of towers and each tower is immediately over truck of railroad flatcar.

form and at other points lower down. The two derricks, one on each of the forward corners, had 100-ft. booms. Swing leads from a 14-ft. bullwheel were carried down from a three-part tackle at the drum on the hoisting engine for accurate control.

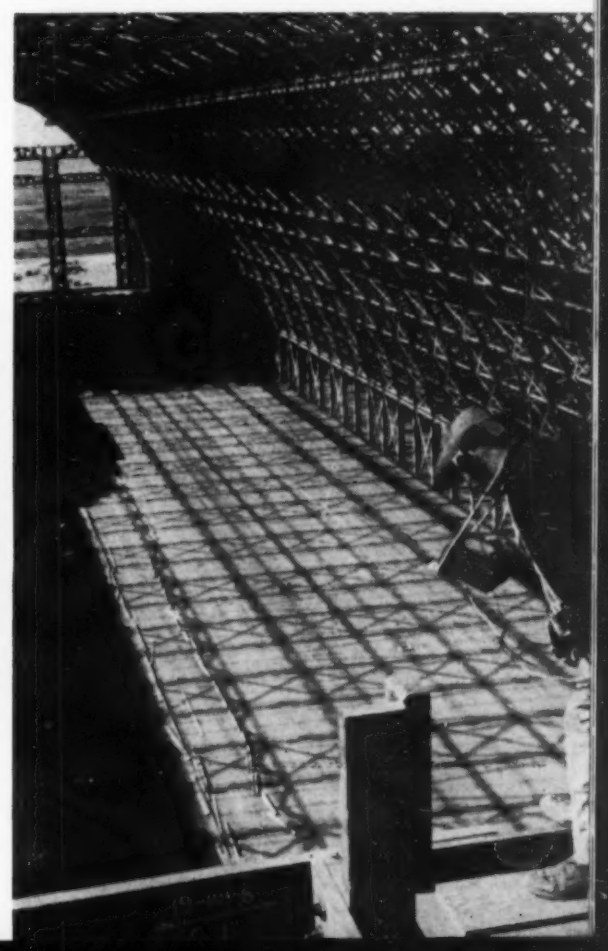
Timber for the dock, which is of 237-ft. span, 170 ft. high and about 1,000 ft. long, arrived on the job preframed and treated for fire resistance. Assembly on the ground into sections of about 12-ton weight was carried on simultaneously with erection. From the traveler were erected purlins and rafters for the 51 arches and all parts of the structure that would otherwise have required false-work, including monorails, monitor, catwalks and electrical installations. Thus,



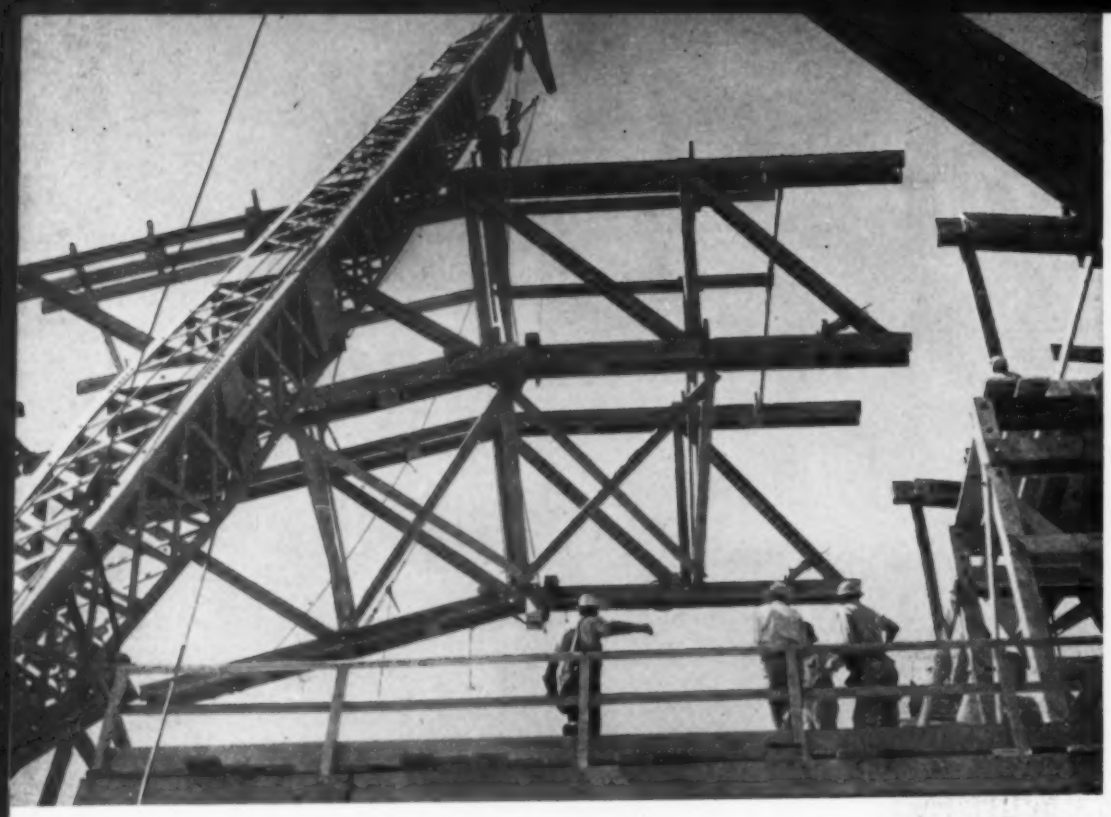
FROM 14-FT. BULLWHEEL on each traveler two swinging leads are carried down to steam engine from corner of top deck, on which interesting timber detail is used.



SPECIAL TRAILER with solid tires on wheels transports assembled arch sections to point within reach of boom of traveler.



TWO-WAY COMMUNICATION SYSTEM (below) is used by foreman of crew working on traveler to give orders to man at controls on steam engine. Amplifiers and transmitter, built into same unit, are used at both ends, eliminating earphones.



FINAL SEGMENT of pair of arch ribs is set in place. Workmen on top deck of traveler are ready to complete joints.

BENTS OF SCAFFOLDING to which skip delivers sheathing have wooden rollers under upper end and skid on lower end. As work advances, scaffold is raised by hoists along inside edge.

when the traveler moved out from under an arch, there was no further need for sending workmen in among the arch members. At the height of the work, after the crews had developed teamwork, three moves of the traveler could be made in one 10-hr. shift, so that 120 lin.ft. of the arch barrel was set up complete in one day's work.

The 700-ton traveler was powered with two steam donkey engines mounted on flatcars that were part of the traveler base. With these engines 40-ft. moves were completed in 3 min. A crew of eleven men working with each of the traveler derricks picked up and raised the arch segments and set them in place. In addition, there were about 20 carpenters bolting up and 20 more on the bottom lacing.

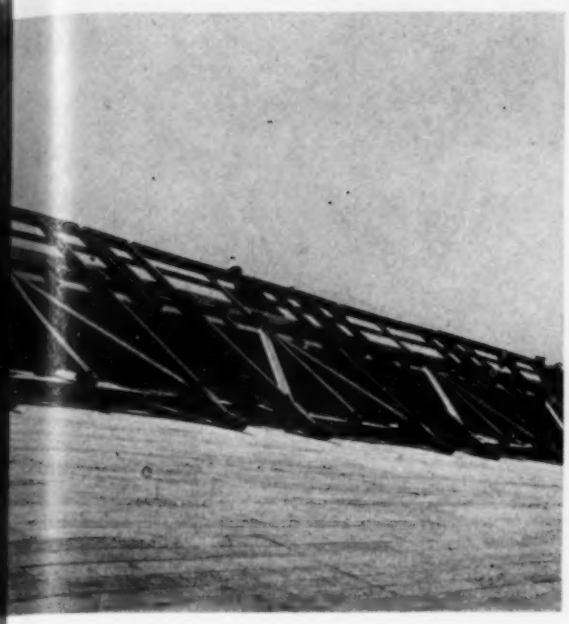
The traveler advanced 40 ft. at each move, thus leaving a 20-ft. gap between each successive segment placed in the arch barrel. As soon as a pair of arch ribs was set up, purlins, rafters and other members to fill in the gap from the previously completed pair were placed by crews on the several working levels of the traveler, using timber attached for this purpose to each segment of the arch at the time the segment was assembled in the jig. At first this material was sent up by being toenailed to the corresponding piece in the assembled section. Later, it was found more satisfactory to fasten on the additional pieces with the aid of tie ropes which were sent back and used repeatedly.

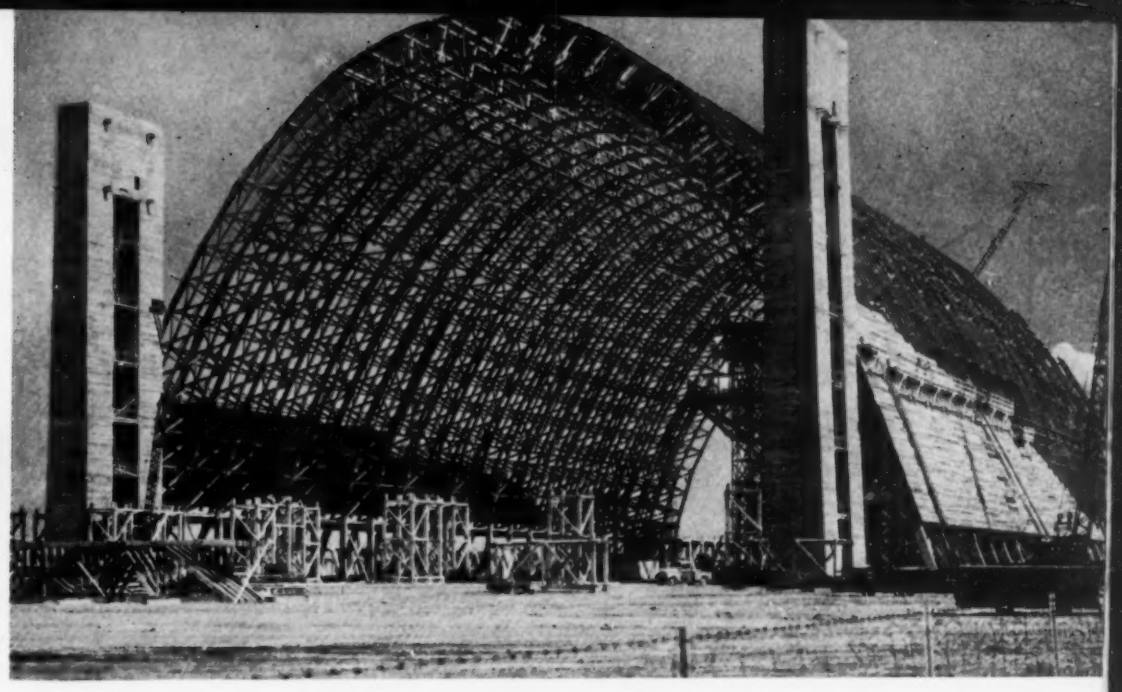
Timber was delivered to the job on railroad tracks beside which stockpiles were arranged for convenient transfer by lumber carrier to jigs for assembly of sections. Each arch went up in five sections, two on either side and a crown section at the top. A crew of ten men at each jig worked with parts put together by others in preassembly. Some 70 men working on the five jigs and their supply lines turned out a maximum of about one section per jig per hour. From the jig to a point within reach of the derrick boom that would place the section in the arch, transportation was by means of a specially built trailer with solid rubber tires arranged in a 14x24-ft. wheelbase.

Among time-saving devices was a hand-operated ram used for driving a pin, in place of a bolt, at any joints where slight disalignment of the bolt holes might have caused delay in getting the joint fastened. The pin could be driven by blows of a 10-lb. spool-shaped ram which slid along an extension of the pin to strike stops at either end of its travel. This device could be operated in rather unhandy positions by use of a rope sling passed around the spool and pulled in such a way as to flip the weight repeatedly against the stop at one end of its throw. The ram was also used with pilot bolts whose threaded end was fitted with a bullet-shaped tip that served to guide it

CRAWLER CRANE (below) picks up one of Byrne door sections and lifts it to position on track.

GRAVITY-OPERATED ROLLER CONVEYOR (below) carries sheathing from skip to point along scaffold where work is in progress.





WITH ARCH RIBS WELL ALONG, sheathing is begun simultaneously on opposite sides. Blimp dock 1,000 ft. long is inclosed by timber arches of 237-ft. span and 170-ft. height.

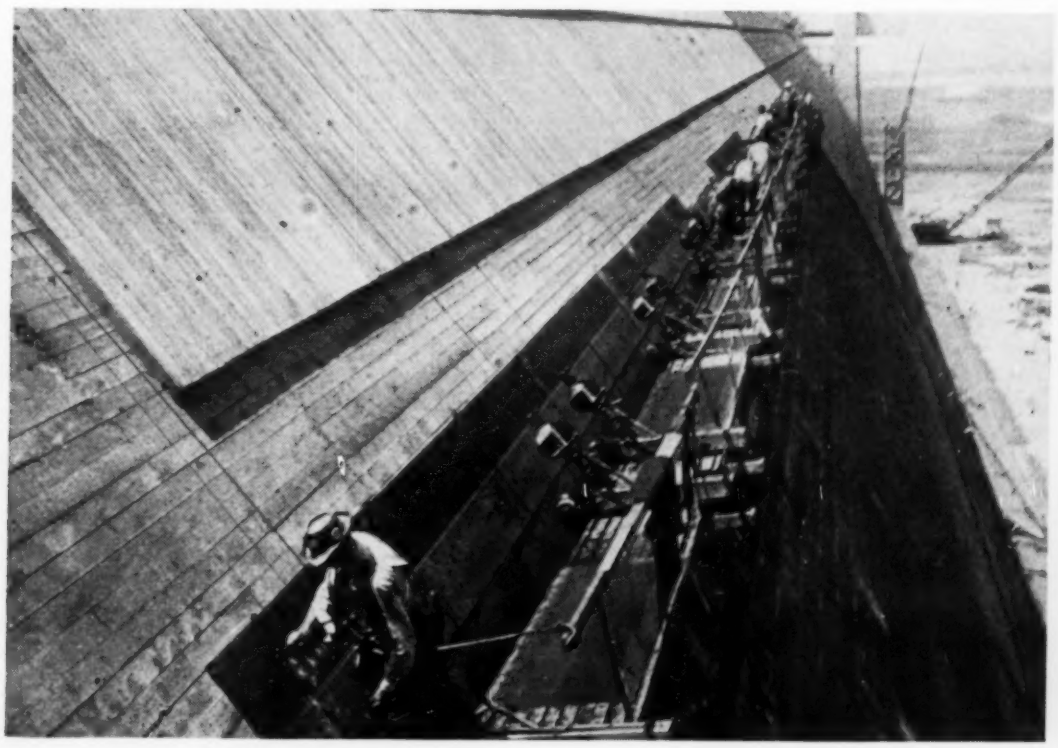
SKIP HOISTS SHEATHING cut in four different lengths to break joints to good advantage.

through holes not exactly aligned, while protecting the standard threads so they would be ready for use after the special tip had been removed.

About 60 days after completion of the first of the two docks built under this contract a crew of 16 riggers spent 10 days tightening all bolts that might have loosened because of shrinkage of the timber. There was considerable take-up and on many of the bolts two turns were required to tighten the nut.

The Moffett Field docks were built for the Bureau of Yards and Docks, U. S. Navy, Vice Admiral Ben Moreell, chief of the bureau, and Rear Admiral T. N. C. Bruns, public works officer, 12th Naval District. Lieut.-Comdr. R. L. Mann was officer in charge of construction and E. F. Sullivan resident engineer in charge of construction. The contract was held by J. H. Pomeroy & Co., Inc. Key men in the contractors' organization were C. T. Gutleben, project manager; J. R. MacDonald, general erection superintendent; C. H. Manning, general dock superintendent; and C. J. Haglund, superintendent of dock enclosure.

ROOFING CREWS (below) follow carpenters who place sheathing. Roofing comes in flat sheets, half of whose width is nailed to sheathing and other half, which overlaps a previously nailed section, is cemented down.

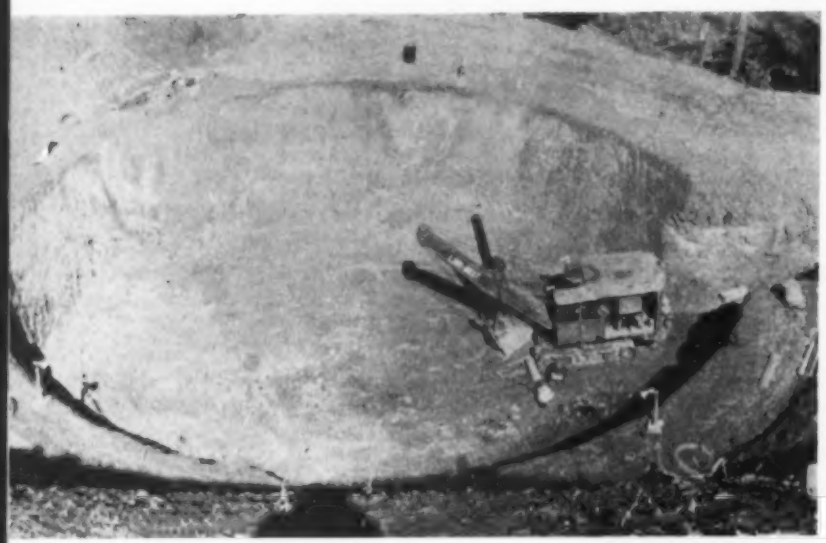


ROOFING OPERATIONS (below) begin just above windows near ground level, starting off at rather steep slope.

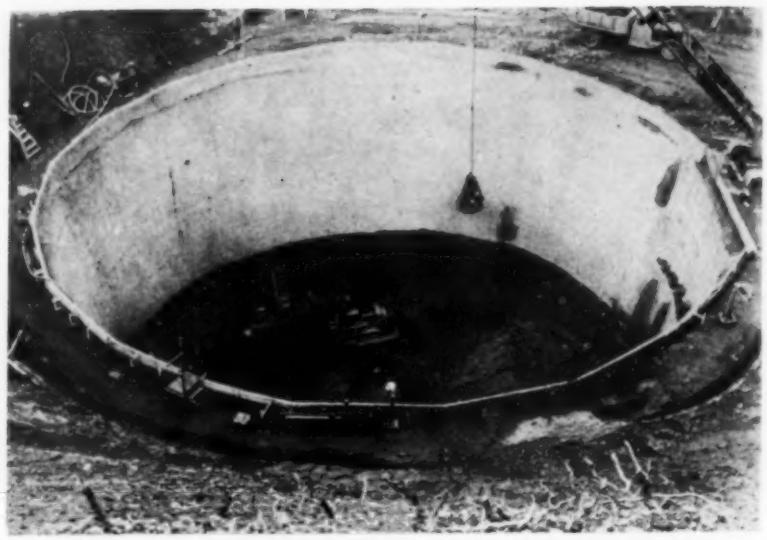
Step-by-Step Field Methods

How Surge Chamber for Tunnel Is Built From Top, Down

1 EXCAVATION of surge chamber is started with 1-cu.yd. Link-Belt power shovel after trench around periphery had been excavated by hand to prevent overbreak.



2 WHEN DEPTH reached 30 ft. ramp became too steep for truck operation and shovel is here leaving excavation under its own power.



4 EXCAVATION CONTINUES with orangepeel bucket operated by same Link-Belt rig, here outfitted as a crane.

3 EXCAVATION IS LINED with 4-in. reinforced shotcrete (below). Plank wall at top keeps out rolling stones. At top left are inside forms for concrete retaining wall that closes excavation made for truck ramp.

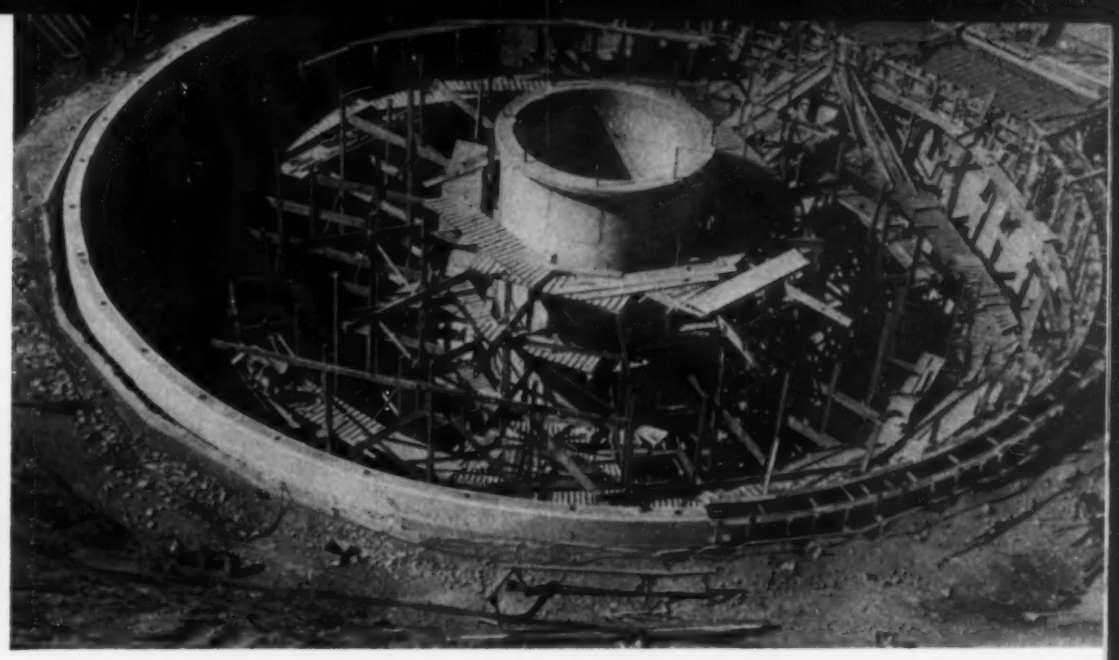
THE SURGE CHAMBER recently built near the lower end of Pit River No. 5 tunnel by the Pacific Gas & Electric Co., of San Francisco, Calif., was constructed as a tapering shaft about 100 ft. deep, ranging in diameter from 91 ft. at the top to 44 ft. at the bottom.

The simplest method was to begin at the top, excavating with a power shovel loading into dump-trucks. This plan was continued, with the trucks climbing a ramp from the bottom of the excavation, until a depth of about 30 ft. was reached. At that depth the ramp had reached maximum grade for the trucks, the shovel was moved out and thereafter excavation was continued with an orangepeel bucket picking up material scraped together by a small bulldozer, a 30-hp. Caterpillar unit.

Before starting, location of the concrete wall that would form the outer shell of the surge chamber was carefully marked out on the ground and was used as a guide for a trench excavated by hand and carried all the way down just a little ahead of the excavation made with power equipment. This plan prevented overbreak and gave an accurately controlled wall face. As each additional 8 ft. was excavated, 6x6 welded wire fabric was placed on the walls and a 4-in. shotcrete lining was put on. This eliminated the need for shoring and provided a form against which concrete was later poured.

Details of this method of construction were worked out by engineers of the Pacific Gas & Electric Co., O. W. Peterson, chief engineer, construction department; H. W. Haberkorn, engineer of hydro construction. The work was under contract to T. E. Connolly, Inc. and Hanrahan Co., joint contractors, and was carried on under the immediate supervision of John De Lucca.

5 ORANGEPEEL BUCKET discharges its load into waiting truck at crest of surge chamber.



6 CONCRETE IS POURED simultaneously in central riser and outer walls of surge chamber. Panel forms are used and 8 ft. is poured at a lift. Outer walls have water stops at quarter-points of circumference and 8-ft. lifts are carried up in alternate quadrants to simplify formwork at joints.

Preventive Maintenance

KEEPS SMALL CONTRACTOR'S EQUIPMENT IN SERVICE

. . . PHOTOS AID OPERATORS

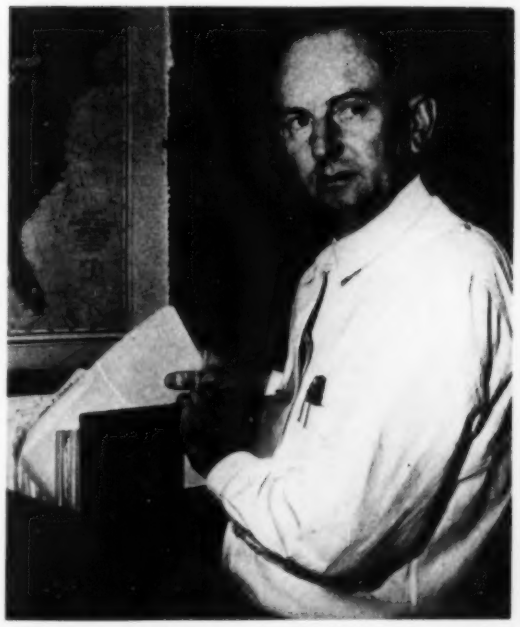
By RUSSELL RALPH
Owner and Manager, Kaw Paving Co.,
Topeka, Kan.

THERE HAS BEEN too much said and too little done about post-war planning. It seems to me the place to start with this sort of a program is AT HOME—with the individual operator. And then it should be more action than "plans," and it should permeate the entire personnel from management to clean-up boy.

Let's assume that late 1944 or the spring of '45 will see the end of the European phase of our current struggle. Assume that such a turn would mean one-half of the war behind us. Then add a year and maybe two for finishing the war in the Pacific. These figures are not prophecies; they are merely arbitrary sign posts for the guidance of constructive thinking.

Now—what does all this mean to a small contractor?

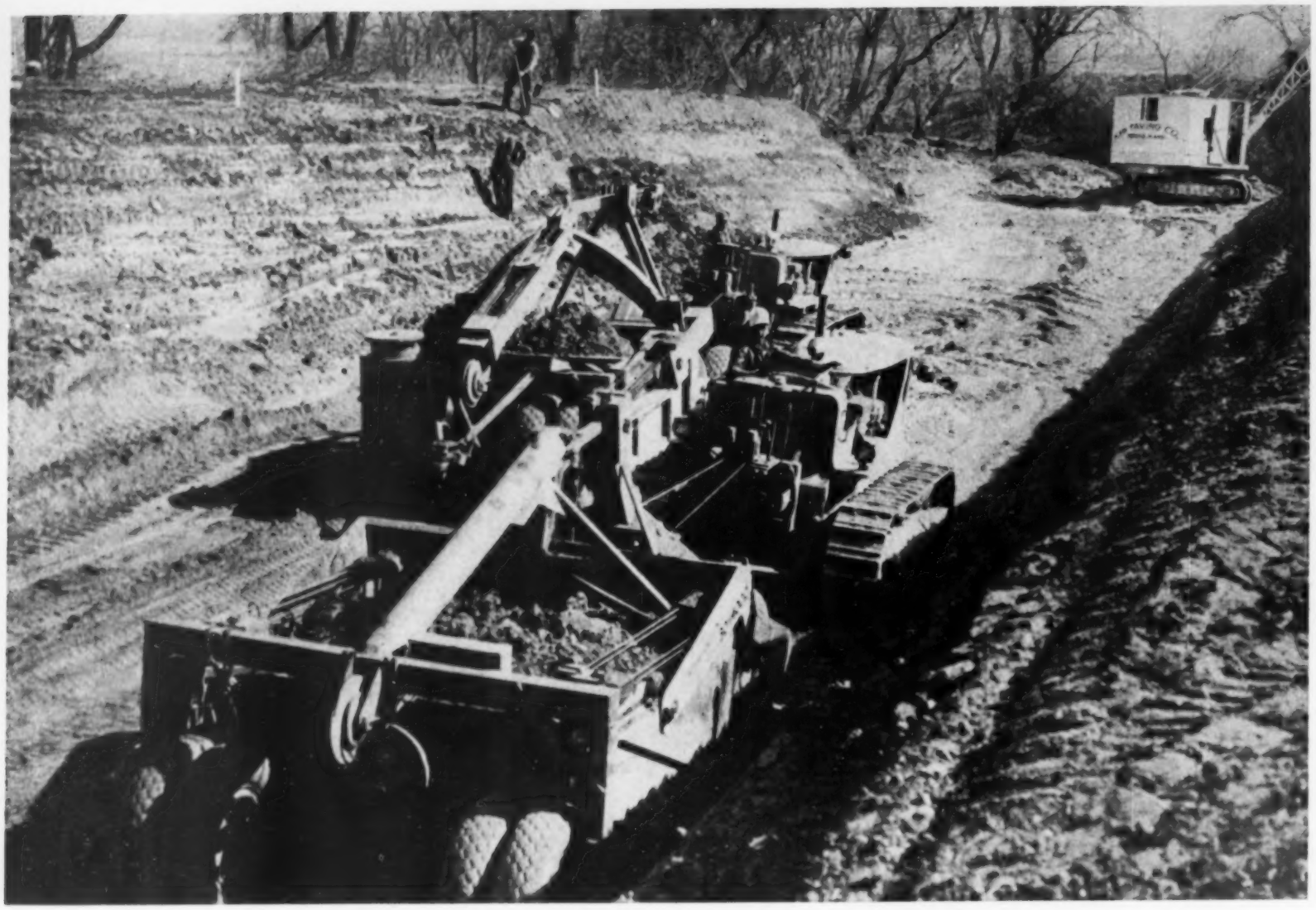
One thing that seems certain is that we are going to be short—or at least semi-short—of steel for a considerable length of time. By the time the war is over, most of us are going to stand in



RUSSELL RALPH, owner and manager of Kaw Paving Co., Topeka, Kan., tells of problems of small contractor in accompanying article.

dire need of new machines and equipment. And for various reasons, chiefly the huge backlog demand for consumer goods, we may not be able to get all we need. All of us in the contracting field have had considerable experience in the matter of doing without since 1941.

We have said, "I'll make this last another year until the war is over." I believe many of us have yet to face the actual situation. We should do this now. The machines and materials needed by contractors are not going to be plentiful again with the signing of the armistice. I really believe we are going to be allowed less, instead of more, materials and equipment. Less in 1944, and again less in 1945. This may sound lugubrious and out of line with current thought, but it is one man's opinion—and an opinion which, when considered to the point of adoption, leads to the end of "all to gain and nothing to lose." To say that we must take another hitch in our equipment belts, spend even more thought and effort on



CONSTRUCTION EQUIPMENT units of Kaw Paving Co., here shown at work on war contract, are subjects of regular maintenance.

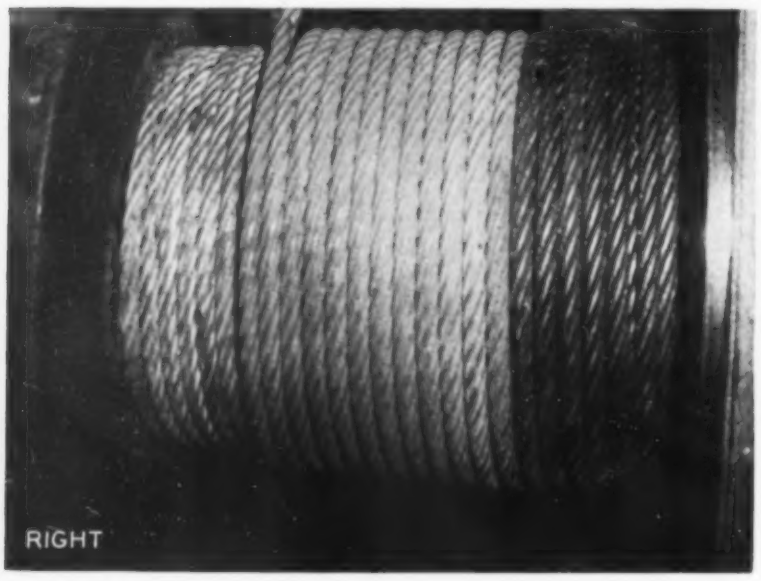
keeping what we have in good operational condition, sounds like "old stuff." But it's true.

In 1942 the Kaw Paving Co. ended the year with 85 percent of total operations charged to war work—war contracts. In 1943 it was 100 percent. We were able to buy most of our needed replacements and new equipment through priorities. But 1944 will not be the same story. As war contracts taper off and more business of pre-war type comes to us, replacements will become more and more of a problem.

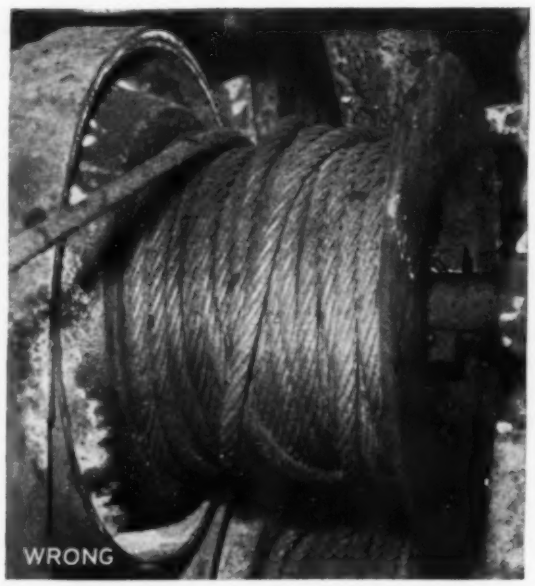
To date, by an intensive program of preventive maintenance, we have been able to hold our equipment in good shape. Our tractors, scrapers, excavators and cranes are in as good repair today as they were a year ago. As I said, this results partly from the fact that we have been able to make needed replacements because of our all-out war work. But in the main, we credit the longer life and better repair condition to our increased efforts and to buying a type of equipment which guarantees us longer life.

For example, we use about 10,000 ft. of wire cable in our operations. We have a fair reserve. We are fortunate that our

(Continued on page 154)



RIGHT AND WRONG SPOOLING of wire rope is one subject of many illustrated by photograph file of 8x10-in. prints maintained by contractor for instruction and guidance of his workers.



THE JOB JESTER

CARTOONS DRAWN FOR CONSTRUCTION METHODS

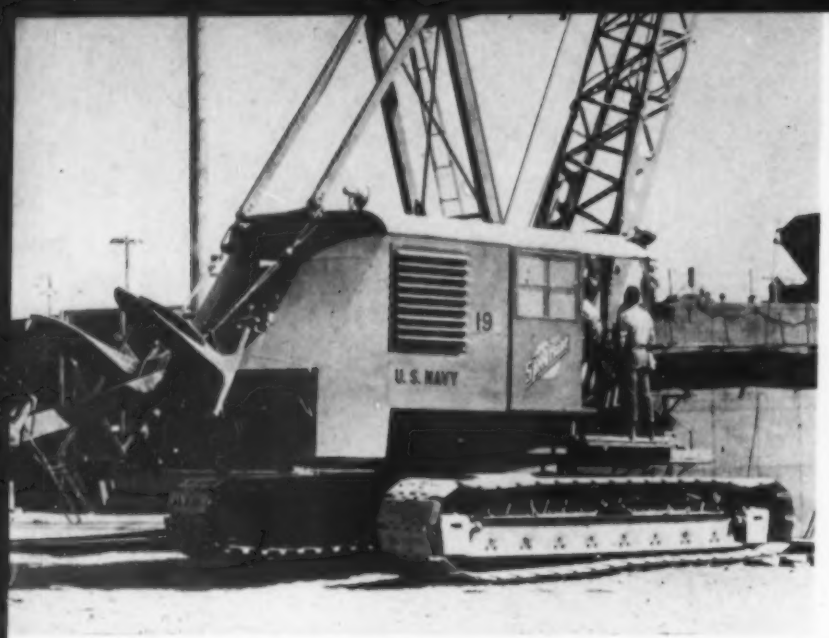
"I called you in about that construction job. Have you time to look over some figures?"

"He just said his first word. You shoulda heard what he called that shovel operator!"

"Oh, fudge!"

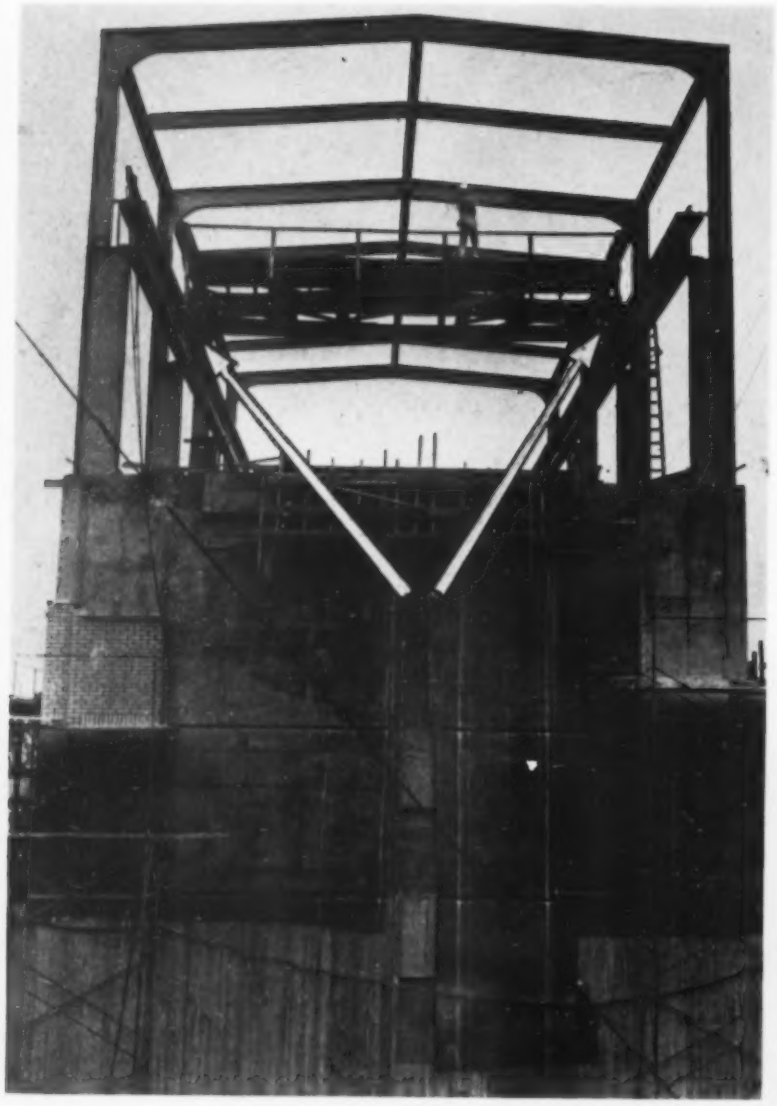
HOW They Did It

CONSTRUCTION DETAILS For Superintendents and Foremen



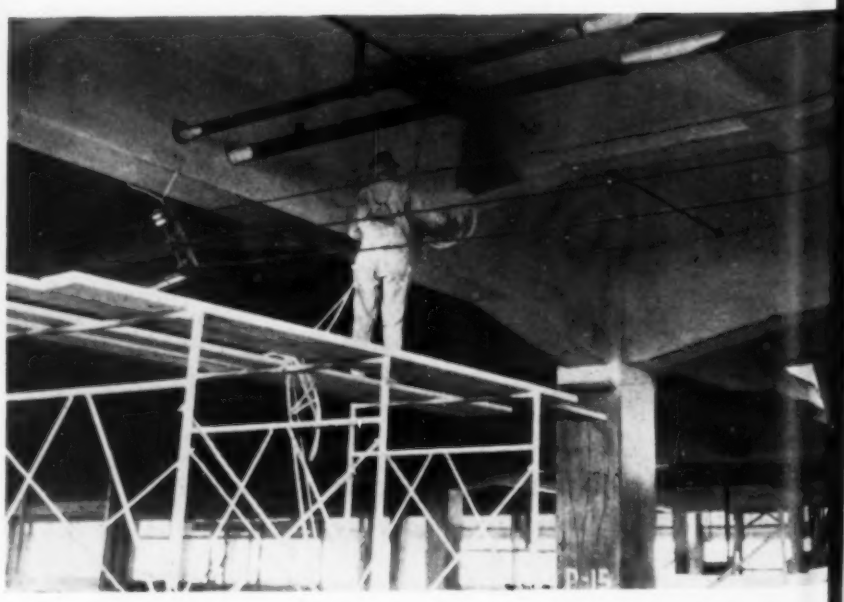
SIX-TON ANCHOR hung on rear of Manitowoc crane serves as counterweight to insure stability of machine as it lifts prefabricated section of ship weighing 27 tons into place at Eureka yards of Chicago Bridge & Iron Co. Crane has rated capacity of 17 tons at 40-ft. radius.

HEAVY LOADS OF COAL are taken from 15-in. seam and dumped into trucks by Bucyrus-Erie ¾-yd. dozer-shovel mounted on International TD-9 diesel crawler tractor. Unit's hydraulic control provides down pressures up to 4,200 lb. for direct digging bites into seam. Shovel serves fleet of six International trucks which haul average of 6 tons per 3-mi. trip to grading plant of Victory Coal Co. at Pittsburg, Kan.



MOBILE JOB-MADE BRIDGE mounted on discarded idler rollers from Caterpillar tractors rides on permanent craneway rails of Mill Creek pumping station, Cincinnati, completed recently by LaCrosse Dredging Corp. and Ferd J. Robers Construction Co., contractors for U.S. Engineers (described in "Construction Methods," April, 1944). Rolling bridge, indicated by arrows, provides convenient working platform for erectors and painters of welded steel superstructure frame and later proves useful in placing precast hollow-core concrete roof slabs manufactured with prestressed reinforcement in lower (tension) portion of slab by Price Bros., Dayton, Ohio.

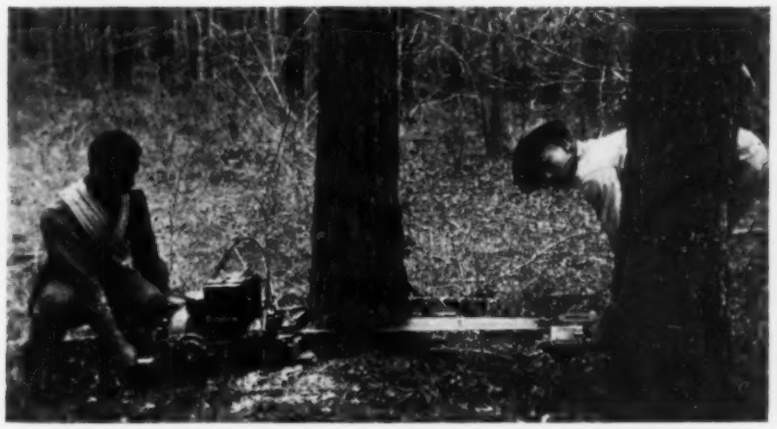
ROLLING SCAFFOLD (below) provides elevated platform from which painter sprays underside of reinforced concrete mezzanine floor at new plant of Higgins Aircraft, Inc., near New Orleans (described in last month's issue). Note how sprinkler pipes pass through beams and girders.



POWER-OPERATED SAWS help solve labor shortage in southern pulpwood operations. Lowther power-driven circular saw, mounted on dolly, can be adjusted to cut either horizontally (above, left) or vertically (below, left). Disston portable chain saw (above and below, right) can be carried where no wheeled equipment can penetrate.

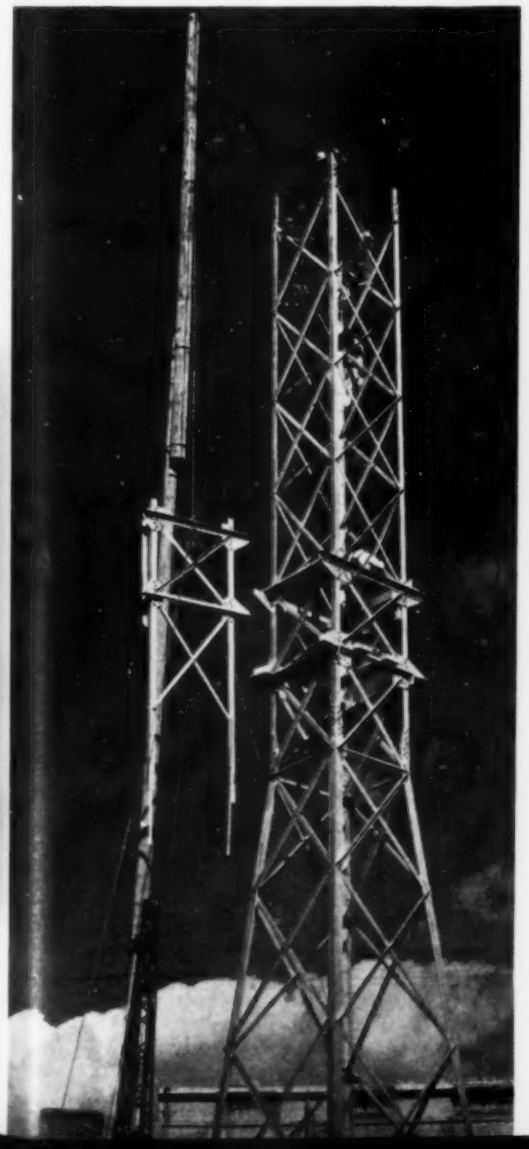
Photos, International Paper Co.

TWO WOOD-POLE EXTENSIONS (below) increase to overall length of 85-ft. boom on truck-crane employed by Larson Construction Co., of Denver, Colo., to erect tall structural steel towers at switchyard of 100-mi. Shasta-Oroville transmission line in California, being built for U.S. Bureau of Reclamation, and described in last month's issue.



TRAVOGRAPH (below) cuts four brackets in one operation at Jacksonville, Fla., yards of St. Johns River Shipbuilding Corp. Machine follows pattern laid out on table in foreground and cuts as many as four exact duplicates on steel plate in background in process termed manual tracing. Travograph is also used to burn shape by means of magnetic tracing head.

Quarter Deck Photo



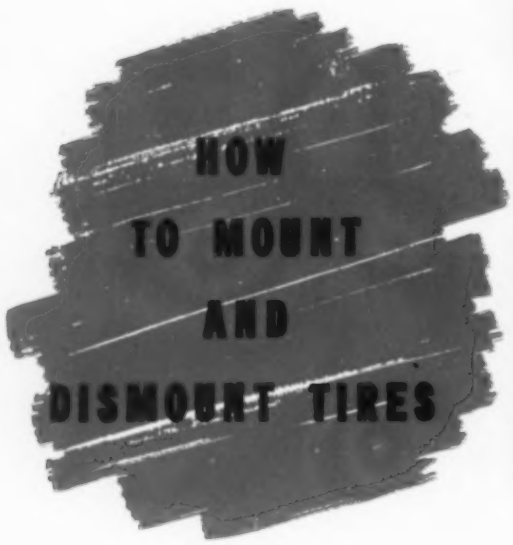
Truck Tire Tips—HOW TO MOUNT AND DISMOUNT TIRES . . . TIRE REMOVAL AND APPLICATION

1 LOOSEN, but do not remove, all nuts, before jacking wheel. Otherwise wheel will turn when operator starts to loosen nuts.

2 WHEN TIRES ARE REMOVED on dirt road be sure to place board under jack, to prevent shifting.

3 REMOVE TOP NUT LAST. Place foot at bottom of tire to keep it from swinging out and binding threads. Place hand on top to prevent tire from falling off rim, and injuring tire changer.

4 WHEN REMOVING WHEEL FROM RIM turn around—face away from wheel and lift off. This position eases lifting strain and reduces possibility of accidents.



5 PLACE GREASE OR OIL ON BOLTS before putting wheel back on. This prevents rust from forming and permits easier removal of nuts next time.

6 IF TIRE IS DUAL, be sure that nuts on inside wheel are securely tightened before applying outside wheel—it cannot be done after outer wheel is on.

7 BEFORE APPLYING WHEEL, center rim properly so that valve on inside wheel can be reached easily with air chuck. This is important point to remember.

8 LIFT TIRE ON RIM, facing away from truck in same way as when wheel was removed. This method subjects tire changer to less strain and reduces possibility of accidents.

HOW TO REMOVE AND REMOUNT TIRES

● Since large-size truck tires are now being built with synthetic rubber, the need for proper care and preventive maintenance takes on added importance. To aid truck operators in obtaining maximum mileage from either natural or synthetic rubber tires the B. F. Goodrich Co., of Akron, Ohio, in a series of photographs taken with the cooperation of the U. S. Army and reproduced herewith, offers timely advice on how to mount and dismount tires and on how to remove and remount them.

1 DEFLATE TUBE and loosen beads from rim flange with tire tools. Even after short service tire beads become stuck to rim flanges.

2 REMOVE LOCKING RING by inserting tire tool in notch provided for that purpose. Stand on ring directly opposite notch.

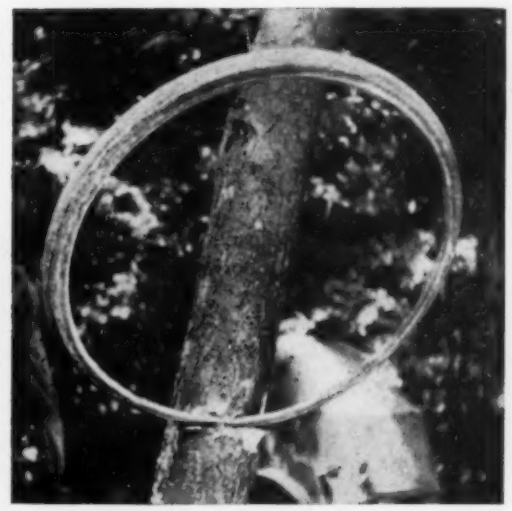
3 PRY FLANGE off a little at a time, moving tire tools only few inches each time portion is loosened. This will prevent bending flange.

4 WHEN FLANGE IS REMOVED, turn wheel over and place on blocks, allowing tire to drop on ground, as shown in this illustration.

5 WHEN INSTALLING TUBES in large-size truck tires lay completely deflated tube on ground in circular position and fold tube in quarters. Then insert one end in tire and unfold.

6 AFTER REMOUNTING TIRE ON WHEEL, apply locking ring and inflate tube to 10 lb. only. Then pound locking ring firmly into place using rubber mallet.

7 TURN TIRE OVER so that locking ring is face down, and inflate to proper pressure. It is imperative that tire be placed in this position to avoid accidents.



8 CAUTION! Here's why you must turn locking ring face down before inflating. This locking ring blew off wheel with tire inflated at 75 lb. because of failure to do this.

TRACTOR PUSHES *Jointed Pipe* OVER MARSHLAND

MARSH AND SWAMPLAND too soft to carry trucks and pipe-laying equipment necessitated an unusual technique in the installation of part of a mono-cast pipeline at Mobile, Ala. The mile-long high-pressure gas line was built by the R. J. Reid Contracting Co. for the Mobile Gas & Service Corp.

For 1,504 ft. of the 2,608 ft. of marsh crossed by the pipe, the ground was so mucky that it was impossible to use trucks, tractors or even men to distribute the 12-in.-dia. lock-joint cast-iron pipe along the trench. This problem was solved by making up the joints on solid ground and pushing them across the swamp with a bulldozer blade on a Caterpillar tractor. A skidway of 40-lb. rails spiked 12-in. apart to crossties was built at the edge of the swamp. The pipe joints were made up successively on this skidway and the successively lengthened pipeline was pushed by the tractor for the first 900 ft. Then cable from a power winch mounted on a truck was attached to the forward end of the section and the additonal 600 ft. was covered by combined pushing and pulling.

The "soupy" condition of the 2-ft.-deep trench provided lubrication for the line as it was pushed along. End of pipe was plugged to prevent entry of mud and provide buoyancy.

The installation also crossed a creek and small island where 304 ft. of Molox ball-and-socket joint pipe was used. The remainder of the distance was over flat tableland where standard doublex simplex mono-cast pipe was installed. All of the pipe was supplied by the American Cast Iron Pipe Co., of Birmingham, Ala.

PUSHED INTO PLACE across swamp by bulldozer blade on Caterpillar tractor. 900-ft. section of mono-cast pipe forms part of mile-long pressure gas line.

Photos, American Cast Iron Pipe Co.

PIPE LENGTHS are jointed successively on skidway at edge of swamp.

LEGAL ADVENTURES of TRACTOR CONN

By LESLIE JOBB

No contractor ever tries to be his own dentist or his own shoemaker. It is even more dangerous for him to be his own lawyer. There are, however, some legal rules which every contractor should know, and these rules may be explained in plain English without resorting to the jargon of the law, unintelligible to most laymen.

This series of articles, dealing with the Legal Adventures of Tractor Conn, a typical contractor anywhere in the United States, explains some of these legal points in plain language for the contractor. Each one is based on an actual decision of an American Court.

The Case of the Disputed Check

A shifty debtor owed Tractor Conn a bill of long standing. There was a dispute as to the amount of the debt.

"$3,777 is every cent I owe you," the debtor contended.

"$8,300 is the correct amount, and I'll not take a cent less," Conn maintained.

While matters stood this way, the client wrote and mailed a check for $3,777.

"I am inclosing my check for $3,777 in full payment for my account to date. Take it or return it," the letter stated. Conn endorsed the check, cashed it at the Contract Bank and sued for the balance.

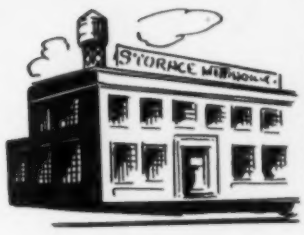
"My check was tendered to you in full settlement," the client protested.

"But I refused to accept it on that basis," Conn retorted.

"If that's the case, you should have returned the check or at least have written that you were not accepting it as full payment. Having accepted it and cashed it, you cannot claim that it was not in full payment," the debtor's lawyer argued. The Court ruled in his favor in Sinclair Refining Co. vs Unadilla Motor & Supply Co., reported in 213 N.Y.S. 81.

"The acceptance of the money involved the acceptance of the condition and the law will not permit any other inference to be drawn from the transaction. Under such circumstances, the assent of the creditor to the terms proposed by the debtor will be implied and no words of protest can affect the legal quality of his act," was the reasoning of the Court.

The Case of the Disputed Lease



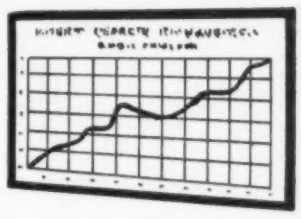
Tractor Conn leased a storehouse in the vicinity of the Belmont bridge contract. The lease provided that the building was to be used for storage purposes and Conn agreed not to use it for any other purpose or to sublet for any other purpose without the consent of the landlord. Then Conn finished the Belmont job and, without consulting the landlord, leased the building to another contractor for storage purposes.

"You can't do that without my consent," the landlord contended.

"Your consent is necessary only when I sublet for some purpose other than contracting storage. As long as I sublet to another contractor it's none of your business," Conn argued, and the Virginia Supreme Court of Appeals ruled in his favor.

"Tractor Conn agreed not to use the building for any other purpose or to sublet it or any portion thereof to be used for any other purpose without the consent of the landlord. The manifest intendment of this covenant is that Conn may sublet the premises without the consent of the landlord for the purpose specified," said the Court in the case of Wainwright vs Bankers Loan & Insurance Co., 72 S.E. 129.

The Case of the Rising Price



"I can handle some of that roofing and glad to get it," Tractor Conn agreed.

"Fine. Just sign here, but you had better take note of this paragraph," the salesman urged, and pointed to the following proviso:

"All contracts subject to strikes, fires, transportation and business conditions, and other extraneous causes which render performance commercially impracticable. Both parties are entitled to the benefit of this clause."

Then, before all the roofing had been delivered, the price took a sharp and sudden rise and Conn's manufacturer refused to deliver the balance.

"We've got your signature to a hard and fast contract whereby you agreed to deliver at an agreed price," Conn demurred.

"That contract's not as 'hard and fast' as it seems to be. What about that clause that it's subject to causes 'which render performance commercially impracticable'? When I can go out in the open market and sell the same goods for about 125 percent of your price, it's certainly impracticable," the manufacturer argued.

"But it's commercially practicable, all right, though it's commercially unprofitable for you. That's an entirely different proposition which the clause doesn't cover," Conn declared and Conn bought the required roofing at the market price. He sued the manufacturer for the difference between that price and the contract price. The United States Circuit Court of Appeals in W. H. Edgar & Son vs Grocers Wholesale Co., reported in 298 Federal Reporter, 878, ruled in Conn's favor.

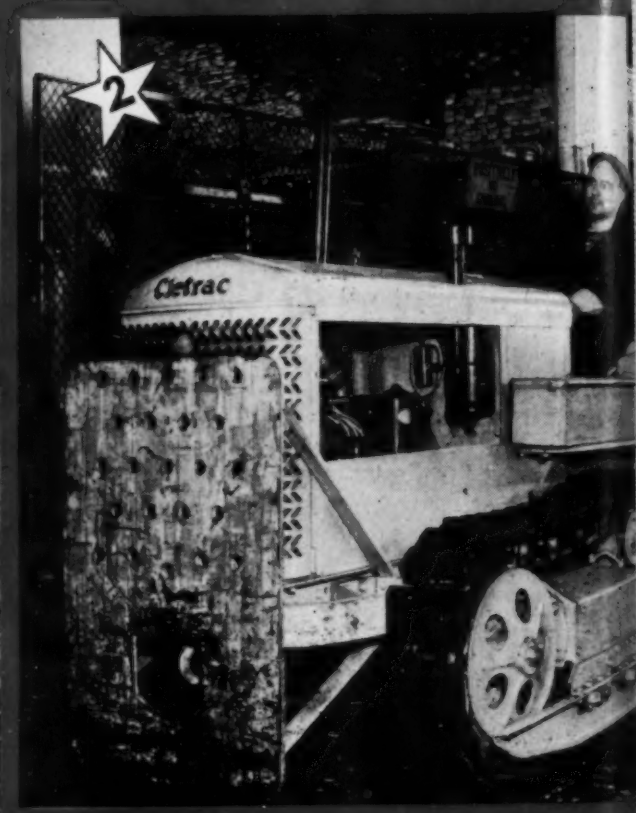
"For courts to allow the obligation of contracts to be treated lightly and disregarded every time either of the parties thereto finds he has entered into a bad bargain would result in chaos, and rightly bring the administration of justice into disrepute," the Court said.

More Legal Adventures of Tractor Conn Next Month

War Demands all sorts of materials

★ LUMBER ★ STEEL ★ OIL ★ MINERALS ★ TR

at the right place a



GASOLINE

CLETRAC *Tru-Tra*

PORTATION

ight time

BACK of the battle lines throughout the world, Cletrac Tru-Traction tractors are helping to produce the sinews of war in sections long distances from civilization. In logging camps—on oil fields—in mines—on new highways—wherever heavy hauling, bulldozing or earth moving must be accomplished, Cletracs are doing the job economically and dependably.

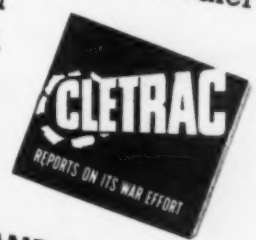
In war plants of the United States and in the industrial centers of the United Nations, Cletracs perform yeoman service in steel mills, on docks, and in warehouses, handling huge loads of war goods in process of production or shipment to fighting forces.

The Cletracs that have been working on these jobs were nearly all produced before the war began, because since war engulfed us, 92% of Cletrac production has been to meet military needs.

While we are still producing to meet the demands of war, with a large part of Cletrac standard production running into 1945 required to complete present contracts, the over-all production of Cletracs has been so greatly increased, that a substantial number of Cletracs are being released for essential civilian use. These tractors are allocated according to government regulations. Your Cletrac dealer will gladly assist you in making application for a new Cletrac if you can qualify as an essential user.

CLETRAC REPORTS ON ITS WAR EFFORT

This folder, recently published, tells briefly Cletrac's part in the war effort. A copy will be mailed on request.



THE CLEVELAND TRACTOR COMPANY • CLEVELAND 17, OHIO

tion TRACTORS

DIESEL

NEW ASSISTANT CHIEF OF ENGINEERS, U. S. Army, in charge of troops, with headquarters in Washington, D. C., is BRIGADIER GENERAL L. D. WORSHAM, who has been at Edmonton, Alta., supervising work on Alaska Highway and Canol oil project. Signal Corps Photo

HONORARY DEGREE of doctor of engineering has been awarded to PHILIP HARRINGTON, commissioner of subways and superhighways for Chicago, by Illinois Institute of Technology at its 50th anniversary. He was cited for "preeminent contributions to engineering construction."

NEW PRESIDENT of Colorado Contractors Association, Inc., is A. S. HORNER, president of A. S. Horner Construction Co., of Denver. Graduate of University of Colorado College of Engineering, he has been principally engaged in construction of dams, viaducts, underpasses and waterworks.

Present and Accounted For...

FIVE-YEAR TERM as member of executive committee of Construction Division, American Society of Civil Engineers, is begun by CLYDE W. WOOD, president, Metropolitan Construction Co., of Los Angeles, Calif. He developed the traveling bituminous road-mix plant that bears his name.

SHASTA DAM BOSSES are (left to right): FRANK CROWE, general superintendent and project manager for Pacific Constructors, Inc.; S. O. HARPER, Bureau of Reclamation chief engineer; and RALPH LOWRY, construction engineer for bureau.

NICARAGUAN PRESIDENTIAL MEDAL of merit has been awarded to COLONEL EDWIN C. KELTON (right), Pacific division engineer, U. S. Army Engineers, in recognition of his services as director of work on Pan-American Highway section. He directed construction of 150 mi. of highway to connect Nicaragua with other Central American republics.

NEW EXECUTIVE DIRECTOR of Associated General Contractors of Massachusetts, Inc., is EDWARD W. ROEMER (left), who was for 8 yr. building commissioner of Boston. He is former president of Building Officials' Conference of America and New England Building Officials' Conference.

NEW VICE PRESIDENTS of The Austin Co., Cleveland, Ohio, are FRANK W. MAYNARD (left), district manager at Oakland, Calif., since 1937, and ROY E. WARD (right), district manager at Los Angeles since 1925.

POST-WAR ECONOMIC PLANNING COMMISSION for Texas is headed by GIBB GILCHRIST, former Texas state highway engineer and now dean of Engineering at Texas Agricultural and Mechanical College at College Station. New board has 31 members.

PAGE OF PERSONALITIES

APPOINTED ASSISTANT COMMISSIONER of U. S. Bureau of Reclamation is KENNETH MARKWELL, former regional director of Federal Works Agency at Richmond, Va. He has been in government work since 1933, when he was appointed senior engineer examiner in Tennessee state office of Public Works Administration. He became state director for PWA in Tennessee and was later named chief project engineer for PWA power developments in Tennessee Valley area.

MERITORIOUS CIVILIAN SERVICE AWARD of Navy's Bureau of Yards and Docks is presented to heads of three construction companies who built Jacksonville Naval Air Station. CAPTAIN ARTHUR GAVIN, (left) commandant of station, pins badge on GEORGE H. HODGES, president of Duval Engineering and Contracting Co., of Jacksonville, Fla. Standing by (left to right) are LIEUT. COMDR. EARL H. THOUREN, station public works officer and officer in charge of construction; GEORGE D. AUCHTER, president, George D. Auchter Co., of Jacksonville; LIEUT. COMDR. ROBERT E. CROSSON, contract engineer; and JOHN E. DAVIS, vice president, Batson-Cook Co., of West Point, Ga.

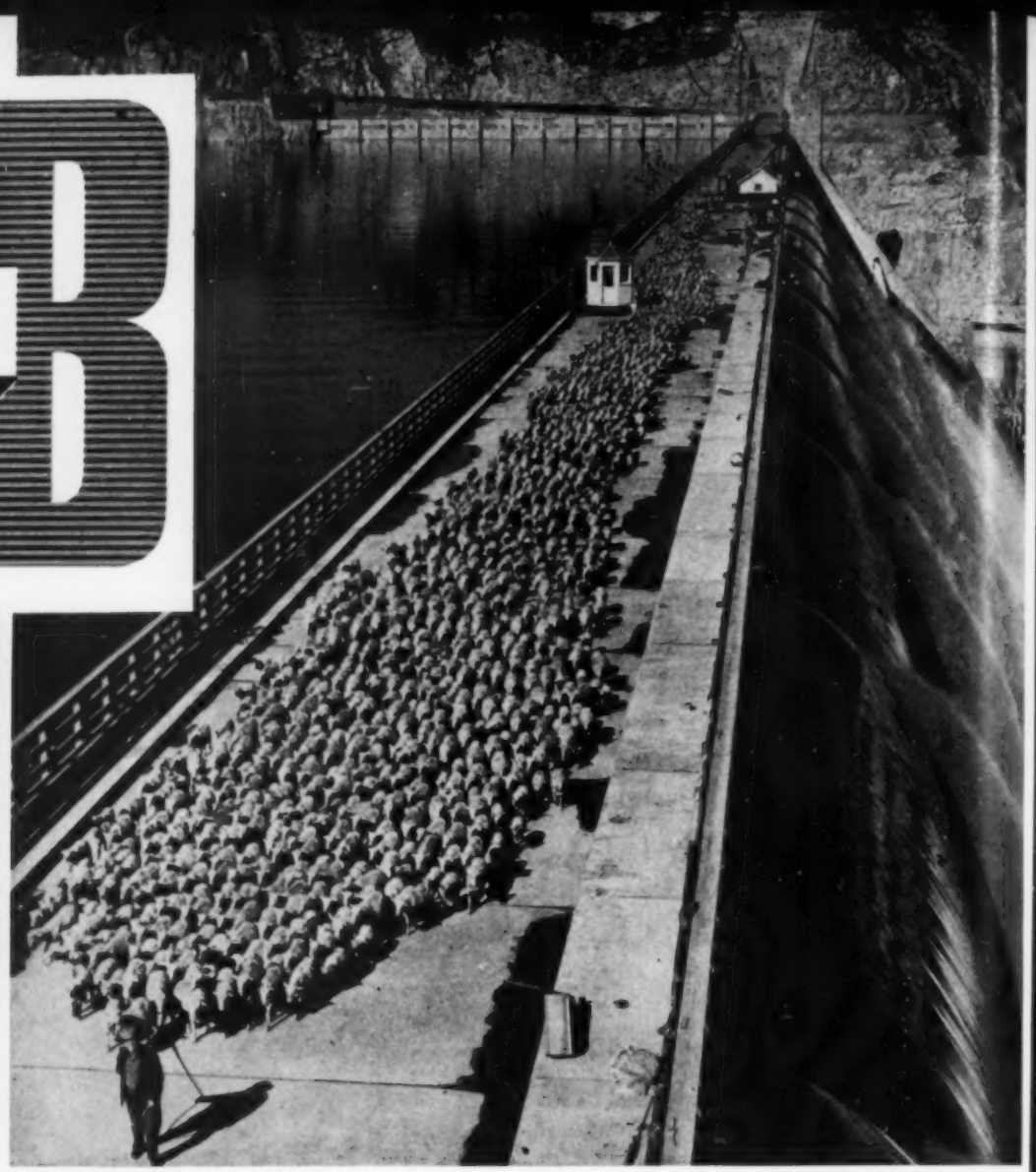
ELECTED PRESIDENT of American Institute of Consulting Engineers is PROF. HAROLD E. WESSMAN (left), chairman, Department of Civil Engineering, New York University. He has been in consulting practice for the last 10 years, concurrently with engineering teaching. He formerly taught structural engineering at Universities of Iowa and Illinois.

NEW PRESIDENT of Constructors Association of Western Pennsylvania is RUSSELL C. SWANK (right), of Freeland Construction Co., of Pittsburgh. He was formerly vice president in charge of the Association's highway division.

JOB oddities

NO KIDDING: This kiddie-car proves time-saver for piping subcontractors, Wallace-Bush Co., in covering immense area of Shipyard No. 3 of Henry J. Kaiser's Permanente Metals Corp., at Richmond, Calif. Here W. C. DI PAOLA, progress engineer, is taken for ride by HERMAN BLUM, junior engineer.

Fore'n'Aft Photo



OVER GRAND COULEE DAM pass nearly 5,000 sheep on way to summer range. Barred to vehicular traffic during war, dam provided passage across Washington's Columbia River without traffic hazards. Dam's huge power plant recently established world record by producing more than 600,000 kw.-hr. of electrical energy in one month.

Bureau of Reclamation Photo

USED OIL DRUMS (left) are welded together by Navy's Seabees to make smokestack for boiler heating dispensary at Aleutian base. This 160-ft. stack contains 36 drums.

Wide World Photo

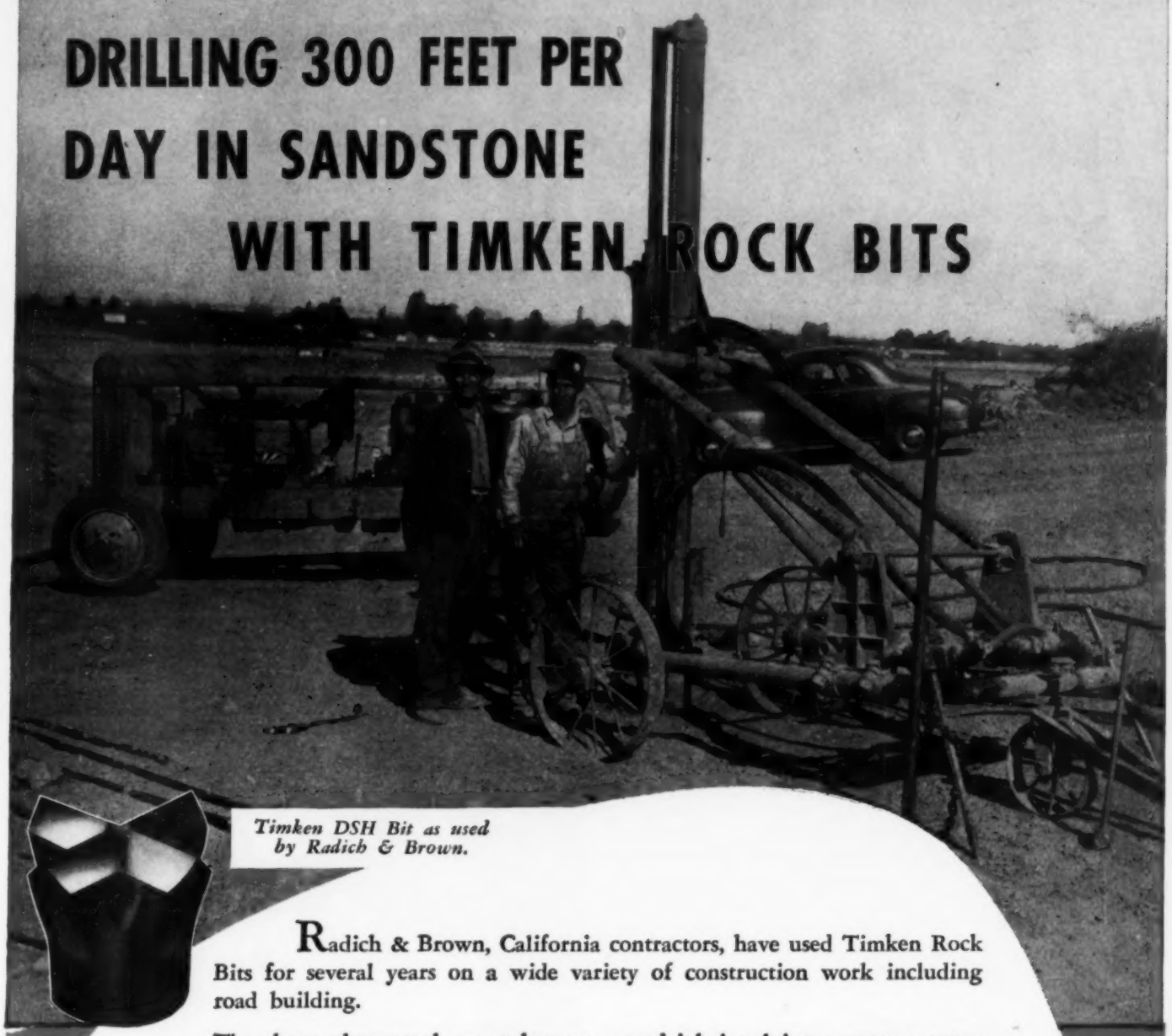
JEEP IS FITTED with flanged wheels (right) and used as railway car. Adjustments necessary include clamp on front axle to hold wheels straight. Pneumatic-tired wheels are carried on brackets fitted to sides and rear of vehicle which can be quickly reconverted for road use.

British Combine Photo

Press Assn. Photo

BARGES CARRY HOUSES 550 mi. down Ohio River from Point Pleasant, W. Va., to Camp Breckinridge, Ky. Twelve-barge convoy moved 120 houses.

DRILLING 300 FEET PER DAY IN SANDSTONE WITH TIMKEN ROCK BITS



Timken DSH Bit as used by Radich & Brown.

Radich & Brown, California contractors, have used Timken Rock Bits for several years on a wide variety of construction work including road building.

The above photograph was taken on a road job involving a great amount of drilling in sandstone. Despite the abrasive nature of this material, they have been getting 300 feet per day with a wagon drill, averaging 60 feet per bit use.

They resharpen their bits by grinding and report an average of five regrinds per bit. Altogether, Timken Bits have proved to be a very economical investment for this user — as they have for many other contractors and mine operators. It will pay you to adopt them no matter what kind of rock you may have to drill. Write for address of nearest Authorized Distributor. The Timken Roller Bearing Company, Canton 6, Ohio.

TIMKEN

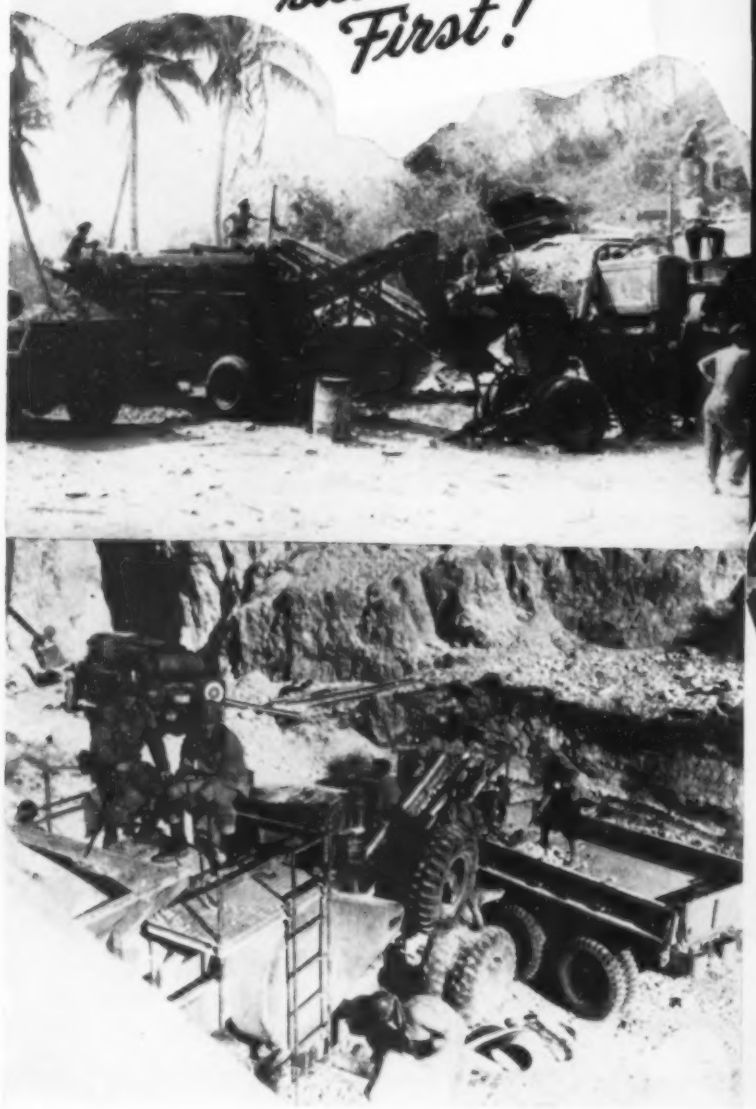
TRADE-MARK REG. U. S. PAT. OFF.

ROCK BITS

5TH WAR LOAN

You can always get CEDARAPIDS EQUIPMENT for essential civilian needs

The Armed Services still come First!



The Iowa Line

of Material Handling Equipment Includes

- Rock and Gravel Crushers
- Belt Conveyors - Steel Bins
- Bucket Elevators
- Vibrator and Revolving Screens
- Straight Line Rock and Gravel Plants
- Feeders — Traps
- Portable Power Conveyors
- Portable Stone Plants
- Portable Gravel Plants
- Reduction Crushers
- Batch Type Asphalt Plants
- Traveling (Road M… Plants
- Drag Scraper Tanks
- Washing Plants
- Tractor-Crusher Plant…
- Steel Trucks and Trai…
- Kubit Impact Breaker…

EVEN THOUGH we're still making aggregate plants for the Army, Navy and for Lend-lease we can accept your orders for more Cedarapids crushing and asphalt equipment. Only the usual releases and priorities are necessary. Just tell us your needs and we'll help you with the priority forms and engineer the equipment to fit your requirements.

Manufacturing facilities and engineering skill which produced and are producing aggregate plants for war use, at such an unprecedented rate, can also be used for essential civilian production. The performance of Iowa plants in producing the aggregates which made America strong means lower cost and better performance on your contracts for highways, airports, dams, and other construction.

The Cedarapids line is complete and will meet any aggregate production problem either from the standpoint of output or character of materials for either an entire plant or a single piece of equipment.

Be sure you come to headquarters for aggregate producing equipment first. See your Iowa dealer or write direct.

Cedarapids

Built by IOWA

ARMY E NAVY

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa

"MICHIGAN" BABBITT TAPES FOR HARD USE

Don't buy a "Michigan" if you want to measure lace curtains. But if you want a tape that will hold up under the punishment of working on an engineering job, you'd better take a good look at this number. It's just the thing for the man who's fed up on tapes that can't be read after a little use. It's the tape that keeps on going long after you forgot when and where you bought it—and for how much.
LUFKIN
ARMY NAVY
WRITE FOR FREE CATALOG 12
LUFKIN
SAGINAW, MICHIGAN • New York City
TAPES · RULES · PRECISION TOOLS

CONSTRUCTION EQUIPMENT NEWS

JULY, 1944 REVIEW of Construction Machinery and Materials

VIBRATORY CONCRETE FINISHING SCREED incorporates new vibratory principle which, its makers claim, speeds placing, improves finishing and saves cement. Assures uniform vibration and provides accurate strike-off and compaction in single easy operation. Available in 6-, 10-, 13-, 16-, 20- and 25-ft. models, each adjustable in width. Finishes up to 6,000 sq. ft. per hr. Especially useful

for work in tight spots and on floors and is said to be ideal for this type of operation on roads, runways and in service areas. Gas-powered models are effectively powered by 1½-hp. air cooled, variable speed Briggs Stratton gasoline engines, featuring Master automatic clutch, special vibrating element and V-belt drive. Vibrating speed adjustable from 2,000 to 6,400 rpm. to assure adequate vibration for cases where slabs are heavy and low slump concrete is used. Electric powered models equipped with two ½-hp. Master electric motors giving two operating speeds of vibrating element. These speeds controlled by three pole switch are 3,400 and 4,500 rpm., furnishing adequate vibration for initial strikeoff and lesser amount for precision finishing.—**Master Vibrator Co., Dayton 1, Ohio.**

★ ★ ★

COATED ALUMINUM BRONZE ELECTRODE of shielded-arc type, is said to produce welding deposits of great strength and hot ductility combined with desirable resistance to corrosion and to have an almost universal application in welding of bronzes, malleable and cast iron or steel. May also be used for welding dissimilar metals, such as cast iron to brass, steel to malleable iron, or in joining of any two metals which are weldable with aluminum-bronze. Sizes from ⅛ to $\frac{5}{32}$ in. in 14-in. lengths are standard and ¼ to ½ in. in 18-in. lengths may be procured on order.—**Wilson Welder and Metals Co., 60 E. 42nd St., New York City.**

THIN LEAD, NON-SOLUBLE COLORED PENCIL is made of tough fibered colored lead bonded to wood casing to form one solid unit. Said to withstand above normal pressure and to produce writing that is satisfactorily smooth in spite of its wear resistant qualities. Sharpens to a fine point ideal for checking, marking, signatures, map making, accounting, shipping records, blueprints and any range of work that requires use of colored pencil. To enable user to identify each color more easily and quickly, wood is finished in brilliant, enameled color to match lead.—**Reliance Pencil Corp., 22 S. Sixth Ave., Mt. Vernon, N. Y.**

★ ★ ★

ACETATE SAFETY GOGGLES light in weight without sacrificing strength are now available in two new models for general industrial use. Claimed to be ideal for workers who wear non-prescription safety glasses, and especially so for those who must wear Super Armorplate lenses ground to their own prescription. Also recommended for "metal-allergic" workers whose skin is sensitive to metal goggle frames. Spark-proof quality makes them of special interest to men on operations where tiniest spark can cause fire or explosions. Goggles are said to have stronger, more massive front than

ordinary acetate goggles patterned after zylonite spectacles. Groove in lens rim is deep, forming a lens seat with substantial backing to resist impact. Bridge made of extra heavy stock with slight amount of face form to provide added side protection. Nose pads also of heavy stock have well rounded edges and ample flare to withstand jolts and blows. If properly fitted, comfort cable temples will hold goggles snugly in position, thus preventing any tendency to slide forward on nose. One model is available in pink crystal with white or Calobar 6-curve Super Armorplate lenses. Other is fitted with side shields and comes in pink crystal with white 6-curve Super Armorplate lenses.—**American Optical Co., Southbridge, Mass.**

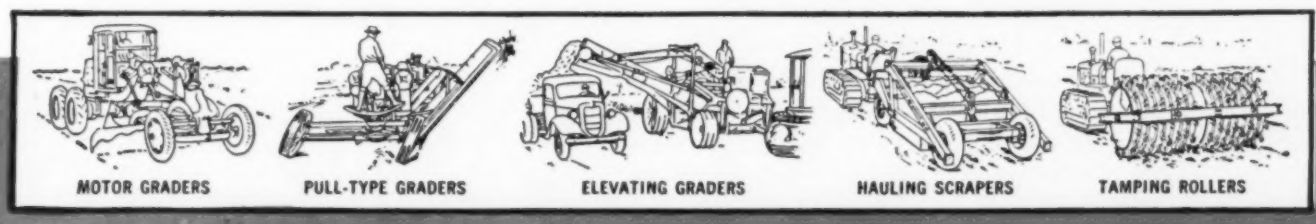
One of a series of ads on Adams motor grader features

**"We use our Adams Motor Graders in a dozen and one different ways," says a midwest road contractor, "and because they are so versatile, they are just about the most valuable machines on our jobs. Depending upon the job, of course, we use them for cutting back and finishing banks, for cutting and finishing the ditches, and for bringing the sub-grade to specifications. If the job happens to be a blacktop or stabilization mix, the graders do the mixing and spreading. The scarifier comes in handy many times and I am thinking perhaps we should have one of those bulldozer attachments for the front end of the machine for pushing rubbish off the right-of-way and for minor leveling operations."

Whether you are contractor or highway official, you, too, will find many profitable uses for Adams Motor Graders on the building and maintenance of roads and streets, airfields and flight strips, and in logging and strip-mining operations. If you have work connected with the war effort, perhaps you are eligible to obtain one of the few new machines allocated for this purpose. Talk the matter over with your local Adams dealer.

J. D. ADAMS COMPANY · INDIANAPOLIS, IND.

At war's end we'll need many new roads and many jobs for returning service men. Plan post war projects now and meet both needs.



ADAMS ☆ ROAD-BUILDING AND ☆ EARTH-MOVING EQUIPMENT

CORRECT Lubrication means *Better Maintenance*

PROBLEM—excessive wear, difficult maintenance.

SOLUTION — *Correct* lubrication.

Sinclair provides highly specialized oils and greases for better lubrication of *CONSTRUCTION MACHINERY*. Sinclair Motor Oils and Gear Lubricants stand up . . . give *safe* lubrication under severe punishment in heavy duty operation.

Sinclair Ten-ol 200 is highly efficient in Diesel engines and Diesel - powered shovels, buckets, and bulldozers.

Is maintenance a worry? Let us tell you how Sinclair lubricants make for *better maintenance.*

(Write for "The Service Factor"—published periodically and devoted to the solution of lubricating problems.)

SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

You Can Do More Profitable Black Top Paving Jobs

with an ADNUN

- Lays any mix—hot or cold.
- Lays any thickness.
- Lays any width.
- Reduces waste of materials.
- Will lay pavement to any specification of crown or bank.
- Power to handle the heaviest truck.
- Four-wheel drive—no slipping.
- One man operation.

Fast placing of heavy crushed rock or slag to meet standardized specifications in one or two courses up to a depth of 6" is one of the most successful extra uses of this versatile paver. Adnun features insure compaction and a tight joint at the curb or with parallel courses due to the action of the overlapping Cutter Bar, save time and labor by eliminating forms.

On rush jobs, two Adnuns can be teamed up, one to lay the rock and the other the binder mix and wearing courses. An Adnun can be quickly changed in the field to handle either black top or crushed rock.

Above: For accurate spreading of stone or slag there is nothing to equal the Adnun. Here an Adnun is laying slag for airport runways.

Below: Adnun laying smooth top surface on airport without need for excessive subgrade preparation. Note smooth finished surface and tight joint between strips.

ADNUN
TRADE MARK REGISTERED
BLACK TOP PAVER

No other machine has proved so adaptable to such a wide range of materials used in construction. No other paver has Continuous Course Correction, power Cut-Off hydraulically controlled as a unit, Variable-Speed Cutter Bar, and Hydraulic Controls to insure fatigueless operation. No other machine will handle crushed rock, slag, soil cement and all types of asphalt mixes with the adaptability of the Adnun Black Top Paver—first in the field and still far ahead in performance.

THE FOOTE CO., INC.
NUNDA, N. Y.
The World's Largest Exclusive Manufacturers of Concrete and Black Top Pavers

WITH CONTINUOUS COURSE CORRECTION

Up where it's cold, the boys have built this home-made cab over the driver's seat of a Heil Bottom-Dump Trailer Wagon to ward off sub-zero blasts.

and he's getting it

with **HEIL** BOTTOM-DUMP TRAILER WAGONS

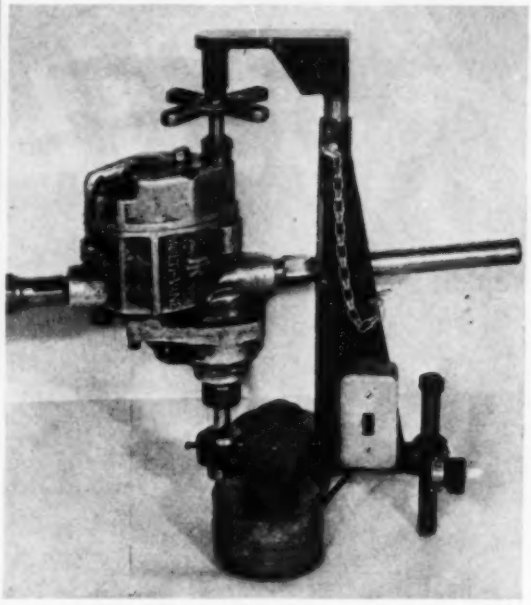
Before the war, many dirt-moving firms were breaking speed records with this Heil unit. Today, the men of the armed services, too, are doing the unbelievable in moving a lot of dirt, in record time. Dumping is under fingertip control . . . all in one heap, or with an even spread. Doors are power-opened — in 2 seconds — under cable control (they close by gravity). You get a 35 inch clearance with the doors wide open — no dragging — nothing to slow up the unit. The operator turns off the windrow at sharp angles whenever he chooses. Place your order now for early post-war delivery.

R-32

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

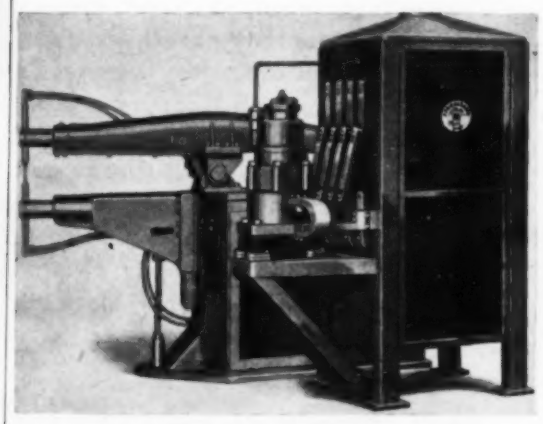
MAGNETIC DRILL POST. expected to bring about great increase of speed in drilling of steel plate on ship construction, is based on invention of Robert Johnson, machinist with Swan Island Shipyard of



Kaiser Co. Through principle of magnetism, drill post is said to eliminate former device that gave drill purchase in deck and bulkhead work. Recent test showed that drill could complete in 5 hr. work formerly requiring 70 man-hr. Weight 37 lb.—**Mechanical Research Co., 610 Failing Bldg., Portland, Ore.**

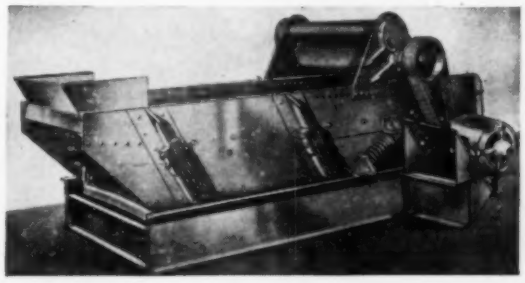
★ ★ ★

STORAGE BATTERY WELDER. dc. resistance welder using storage batteries as source of welding current, has made possible application of resistance welding even in aluminum in localities where power supply limitations have prevented use of other forms of stored energy welders. Only requirement is sufficient power to operate battery charger. Use of batteries as power source for this purpose reduces not only initial cost of welding installation, but also operating costs such as cur-



rent consumption, maintenance and supervisory requirements. Other advantages: (1) Elimination of inductive losses in welding "loop" by use of direct current; (2) elimination of reactance losses between power supply and electrodes; (3) less critical adjustments to get consistently good welds; (4) greater operating and maintenance simplicity. Rocker arm, pedestal and gun types of resistance welders may be used in combination with storage battery power unit.—**Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich.**

HORIZONTAL VIBRATING SCREEN for stationary and portable gravel plants is a full-floating unit available in a variety of sizes, single, double or triple deck, ranging from 2x4 ft. to 4x14 ft. Company claims that this unit will not transmit vibrations to subframe and that it has directional vibration forces that will not become unbalanced. Motor, driven by V-belt drive and replaceable by countershaft, if desired, is mounted to one side of frame on detachable platform. Advantages: (1)



When installed on portable plant, it gives complete access to either roll or jaw crusher by removing crusher hopper; (2) Its use on portable plant reduces to minimum, weight added by such installation; (3) It operates flat, moving material by action of screen, rather than by gravity, thus affording more accurate control over screening; (4) Construction allows piling on of material without injury to screen cloth which means faster yield per hour, in other words, more capacity; (5) Simple and easy to install new section of screen cloth or to rearrange combination of sizes; (6) Saves headroom. **—Iowa Manufacturing Co., Cedar Rapids, Iowa.**

★ ★ ★

STEEL GRAB, with rated capacity of 3 tons, provides positive and easy method of handling steel plate or structural forms in various shapes and sizes with edge thicknesses up to ⅝ in. Important feature of grab is its simplicity of operation and quick method of attachment which permits the use of the device either for lifting vertically

or pulling horizontally. When the grab is hooked and pressure applied, two powerful many-toothed jaws close securely on the sheet and hold it tightly until the lift or pull is completed. The action of the jaws, operating on the principle of a pair of tongs, is such that the heavier the load, the tighter the grab. Holds steel plate or structural forms with a tight 4-in. bite. Features solid, all-welded case construction and stainless steel working parts, heat treated for additional strength. **—Mine Safety Appliances Co., Pittsburgh, Pa.**

"Pals" of G. I. Joe *right now . . .*

HEIL

Cable Dozers

are demonstrating their ability to "take it" on the fighting fronts of the world . . . . .

When peace returns,

famous Heil Cable Dozers will be available. Now, they're needed for the tougher job of clearing the way on the fighting fronts . . . digging in to soft dirt or hard-packed clay with ease . . . leading the way for for men and equipment in their march toward victory.

Heil Cable Dozers are engineered to work with International Harvester TracTracTors as a perfectly balanced team. The simplified mounting avoids obstructing the operator's view — gives him full vision ahead. Here is a machine that performs smoothly — gives fast, positive action under the toughest conditions, with minimum maintenance. Get yourself a post-war "priority" by placing your order now.

Write for bulletins.

B-31

SEE YOUR INTERNATIONAL TRACTRACTOR DEALER

ARMY E NAVY

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

on

ROGERS TRAILERS

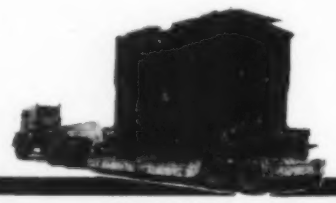
TODAY even airplanes "bum a ride" on ROGERS TRAILERS.

Deck houses for Victory ships . . . huge coastal defense guns . . . giant tanks, all are speeded towards completion and rushed to the fighting fronts on ROGERS TRAILERS.

In War and in Peace ROGERS TRAILERS have proven their ability to "deliver the goods". New models which will be available when war contracts are completed will be even better-engineered . . . more efficient than the thousands which have been used successfully by industry for many years.

ROGERS BROS. CORPORATION
ALBION, PENNA.

EXPERIENCE builds 'em
PERFORMANCE sells 'em

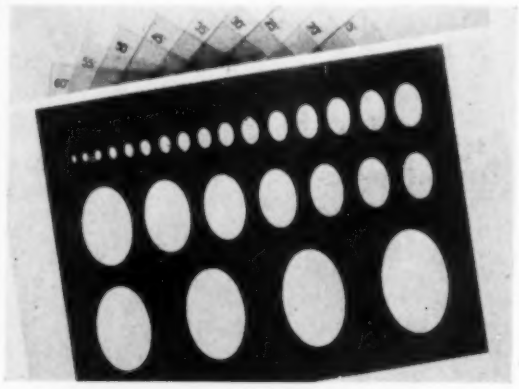


TRUCK CRANE has as its main feature a carrier built for crane work, not for crane transportation alone. Lower center of gravity gives greater stability in terms of hoisting capacity and boom reach, without use of outriggers. With outriggers, working range is proportionately increased, and, being built closer to ground, outriggers require little blocking. Usual problem of sway at boom point is markedly lessened by new weave-proof frame of all-welded box section construction with built-in torsional bar.

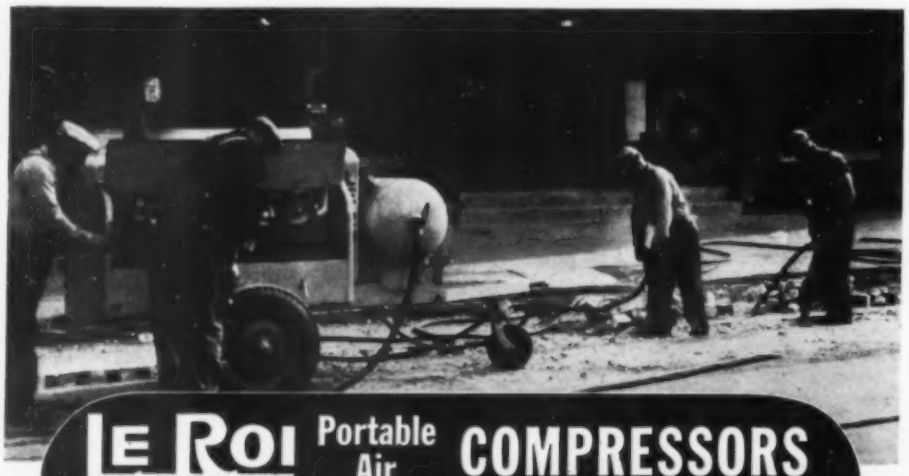
Crane machinery is standard P&H Model 255-A crane upper, complete with low-pressure, direct acting hydraulic control and triple safe planetary boom hoist which prevents boom from falling suddenly. Operation is entirely independent of carrier power, with either gasoline or diesel motor. Entire unit is within standard road clearances and its short wheelbase allows greater maneuverability on highway as well as on job. Tractive power is by double drive axles in tandem. Low range transmission with 10 speeds forward and 2 reverse give greater pulling power. Eight large rear tires provide low ground pressure. Steering is made easy by double cam and roller bearings with 21:1 ratio. All air lines, tanks and braking system are protected against damage. Unit is recommended for all types of material handling work and can be equipped with hook, clamshell, magnet and dragline.—**Harnischfeger Corp., Milwaukee, Wis.**

* * *

ELLIPSE GUIDES, said to effect savings up to 50 percent in time on production illustration jobs, are .020 thick celluloid templates and are made in a set of 10 with angles from 15 to 60 deg. by 5-deg. increments. Templates of 60, 55, 50, 45, and 40 deg. have ellipses from ⅛ to ⅜ in., increasing by 32ds, then by 16ths to 1 in., then by 8ths to 2 in. Templates of 35, 30, 25, 20 and 15 deg.



progress the same, but start with sizes of 5/32, 3/16, 7/32, 1/4 and 3/8 in., respectively. Equally efficient for either pencil or ink, they eliminate the time-consuming geometrical development of ellipses by the plot method and enable the untrained as well as the professional to draw ellipses with equal accuracy and speed in a small fraction of the time ordinarily required. Vertical and horizontal axes are clearly indicated for ready location and adjustment to position. They are furnished either as a set of 10 or separately.—**The A. Leitz Co., 913 S. Grand Ave., Los Angeles (15), Calif.**



LE ROI Portable Air COMPRESSORS
get jobs done faster

Le Roi powered . . . to give you more air . . . in a hurry!

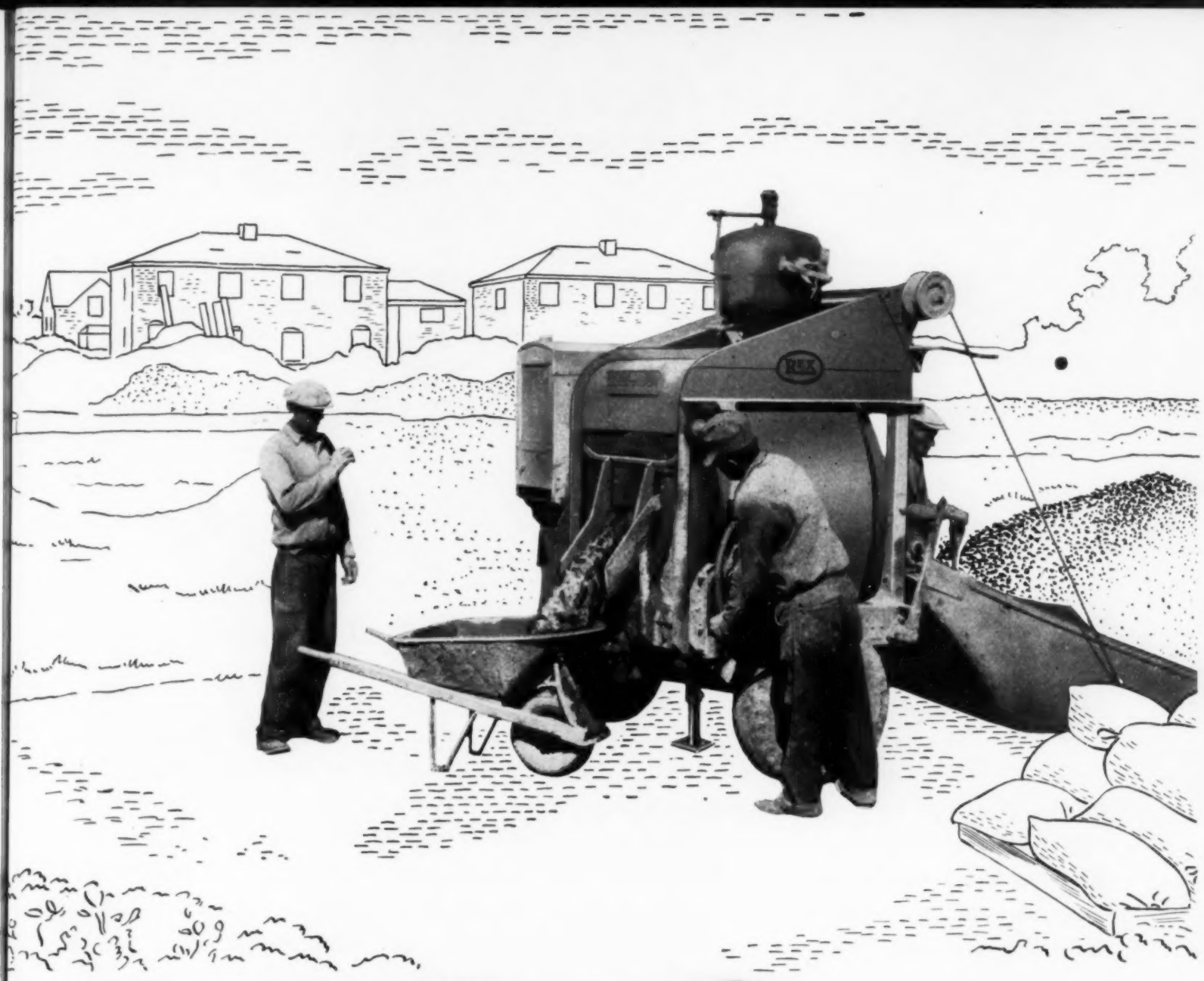
Le Roi Compressors have the quality features that enable you to turn out the tough jobs in record time. They're famous for their extra mobility in getting to the job — on the job — and away to the next one. Le Roi Compressors are the *only* ones in which *both* engine and compressor are built by the same manufacturer — to give you the benefit of integral design, smooth-running teamwork, and undivided responsibility for performance. All sizes are available for approved projects.

Consult your nearby dealer.

C-42

Le Roi Company
1712 South 68th Street • Milwaukee 14, Wisconsin

LE ROI



Tomorrow Means Today...

WITH REX MIXERS

"TIME SAVERS!" That's what users call the Rex mixers. And time-savers are just exactly what these husky mixers are. With their much faster charging and their 6 to 7 second discharge, they get the jobs done faster . . . more economically. With Rex Mixers, you can change *tomorrow* into *today* on the schedule.

There are a lot of other exclusive features, too! Water control is practically 100% accurate . . . drum heads are pressed steel, die formed and welded integrally with the center sheet, eliminating pounds of excess baggage . . . the accurately formed track and rollers support the load without distortion and maintain perfect alignment through years of tough service, develop no flat spots. And the one and only chain belt drive cushions shocks—prolongs mixer life. Those aren't all! Rex mixers have other exclusive features . . . all designed to give you faster, more economical service.

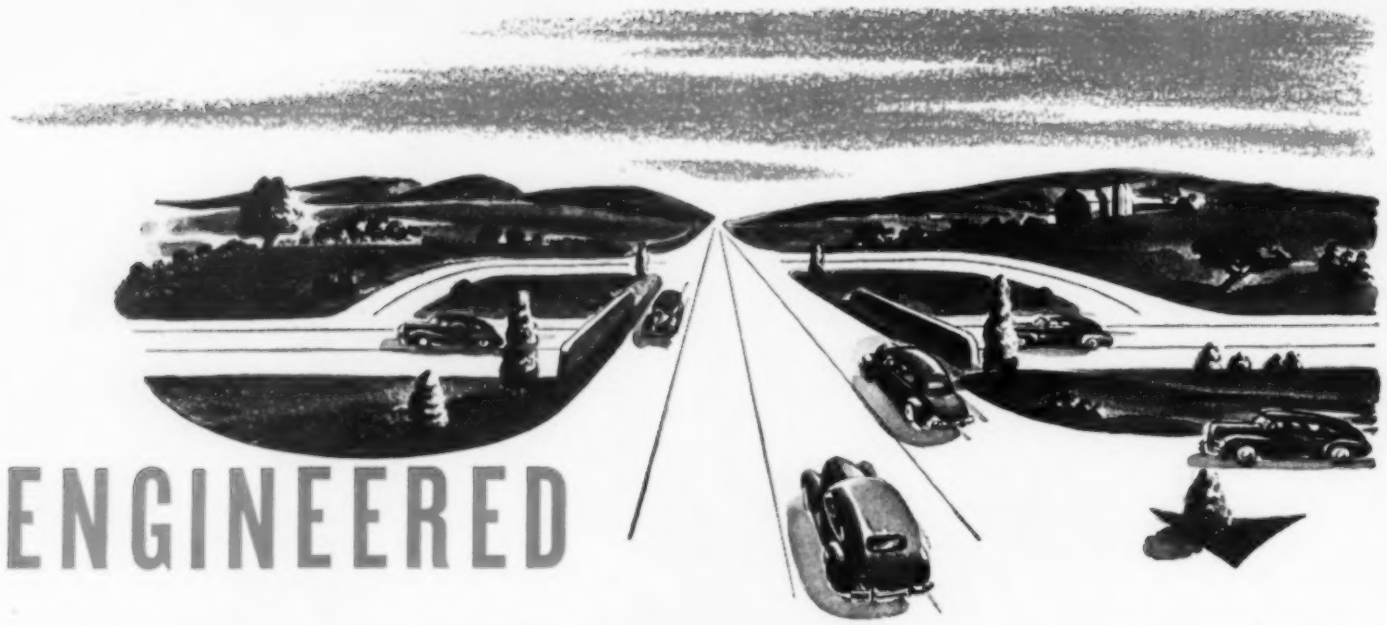
Investigate Rex Mixers—See how they can help you do the job faster at lower costs. And check the other equipment in the Rex line: Moto-Mixers, to speed the mixing, hauling and placing of concrete . . . Pavers, that can give you really heavy yardage production, faster . . . Pumpcretes, that pump concrete by pipe line . . . Pumps, that move water economically and efficiently. Get the complete story. See your Rex Distributor or write Chain Belt Company, 1664 West Bruce Street, Milwaukee 4, Wis.

CHAIN BELT COMPANY
of Milwaukee

REX

CONSTRUCTION MACHINERY

PUMPS PAVERS PUMPCRETES MOTO-MIXERS MIXERS



ENGINEERED

TO THE TREMENDOUS JOB AHEAD

With more than $7,000,000,000 worth of new roads already anticipated as a part of the Nation's road building program immediately after the war, not including maintenance, road machinery will face the biggest test of its career. Standards of performance accepted in the past will not serve the postwar era. These standards must be re-established on a much higher plane of speed, power and dependability.

To meet this challenge HUBER'S Engineers have mustered all of the knowledge, experience and skill at their command. They have cast off tradition-bound practices and "set their sights" on the new future. The results have been amazing.

Today HUBER is "all set" to help the Nation's Road Builders "lick" the tremendous job that lies ahead. It has designed and developed the finest and most complete line of ROAD MACHINERY ever offered to the trade by a single company, with each piece of machinery, rollers, maintainer, bulldozer, sweeper, mower and snow plow, incorporating many new and desirable features. A number of these new features are exclusive to HUBER.

Huber invites distributors to write for interesting facts about its new sales policy and franchise.

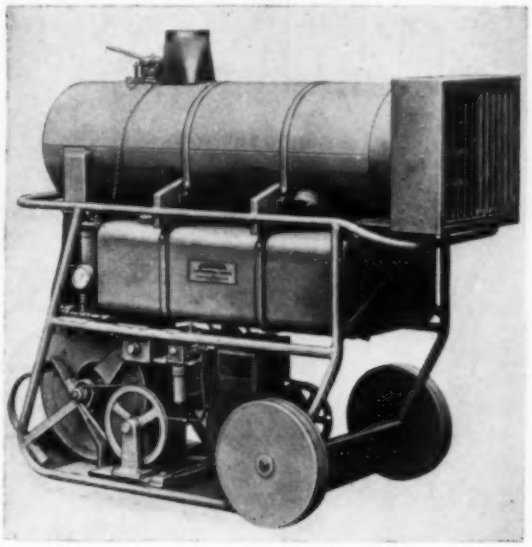
H. C. Ehrick

Chief Engineer

THE HUBER MFG. COMPANY · MARION, OHIO, U.S.A.

3 WHEEL ROLLERS · TANDEM ROLLERS
MAINTAINERS · BULLDOZERS
SPEED-SCOOPS · SWEEPERS
HIGHWAY MOWERS · SNOW PLOWS

PORTABLE MULTI-SERVICE HEATER. said to have tremendous heating capacity and powerful heat delivery, will be of value in the construction field for providing localized heating in unheated warehouses and other buildings; for supplying heat for concrete mixing or preventing concrete from freezing during severe weather; for thawing frozen rolling



equipment treads, brake drums, radiators, and for supplying warmth for contractor personnel out of doors during sub-zero weather. This new "Janitrol" unit embodies "whirl-flame" combustion principle which permits instant lighting in sub-zero temperatures and also makes it impossible for heater to "blow out" regardless of temperature, altitude or

Light enough to handle . . heavy enough to "take it". These HIGHLY PORTABLE CMC's have proven their durability and sturdiness on important jobs all over the world. They are "first choice" Mixers in peace or war. All standard sizes. Get information.

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa
Mixers • Pumps • Hoists • Batching & Placing Equipment • Saws • Carts • Barrows

ABOUT A GRIFFIN WELLPOINT JOB

A Field Report From One Who KNOWS!

Dear Sir:

Your letter and instruction sheets received and thank you kindly for your prompt reply.

As I am only one of the operators, I am not in any position to speak officially for the company.

From observation and inquiries from other operators, I find that these pumps are operating very satisfactorily

Two of these pumps have been on the same location for six months operating continuously and haven't given any trouble whatsoever. My experience with various types of pumps have proven to me that the Griffin Wellpoint is both efficient and economical.

We have a lot of water to pump and they are really doing the job O.K.

For Sale and for Rent

MID-WEST

GRIFFIN EQUIPMENT CO., INC.
548 Indiana Street • Hammond 1662
HAMMOND, INDIANA

SOUTH

GRIFFIN ENGINEERING CORP.
633 N. Myrtle Ave. • Jacksonville 5-4516
JACKSONVILLE, 4, FLA.

MAIN OFFICE: 881 EAST 141st STREET, NEW YORK 54, N. Y.

GRIFFIN WELLPOINT CORPORATION

BETTER CONCRETE FASTER WITH INTERCHANGEABLE VIBER VIBRATORS

9500 R.P.M. IN CONCRETE

The list of contractors who use Viber equipment, and the projects on which it has been used, includes the outstanding names in the construction world! The complete *interchangeability* of Viber equipment, enabling you to add units as desired, or to change them to suit conditions on the job, is another feature that adds to the efficiency of this job-tested equipment, as well as reducing the investment cost.

AIR

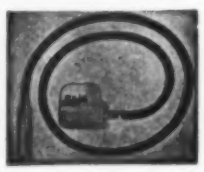
• FLEXIBLE PNEUMATIC VIBRATOR

Made in 1¾", 2½" and 3" diameter with 12 ft. and 21 ft. flexible shaft. Complete interchangeability of flexible casings, cores, vibrators. Operates on 80 lbs. pressure.

ELECTRIC

• FLEXIBLE ELECTRIC VIBRATOR

Made in 1¾", 2½" and 3" diameter with 12 ft. and 21 ft. flexible shaft. Complete interchangeability — Flexible Casings, Cores, Vibrators, Universal type motor. Built-in protective "ground."



GAS

NEW FEATURES "GAS" VIBRATOR

Mercury clutch, entirely automatic, picks up load at 1500 r.p.m. allowing engine to idle without running vibrator, eliminates stalling, makes starting easy in cold weather.

Upsetting is practically eliminated in mounting. Handles allow complete unit to be easily carried.

NEW CATALOG

Illustrates and describes the latest Viber equipment — gives complete data on casings, cores, speeds, power, weight, etc. Also new features. Also list of users and jobs where used. Write for your copy today.

VIBER COMPANY

726 South Flower St.

BURBANK, CALIFORNIA

air density, a quality assured by continuous ignition and "self-piloting" combustion process. Flame whirls by tangential introduction of air into combustion chamber becoming a tightly wound spiral resulting in complete combustion and providing instant heat wherever and whenever needed. Equipped with gasoline-engine or electric-motor drive and mounted on two-wheeled carriage, unit may be moved in wheelbarrow fashion or pulled sled-fashion over snow, ice or mud.—**Surface Combustion, Terminal Tower, Cleveland, Ohio.**

★ ★ ★

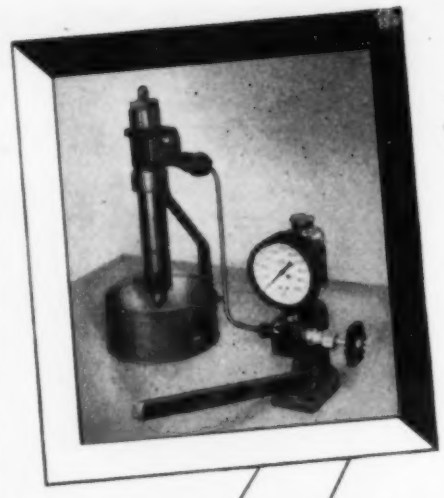
PORTABLE HEATING TANK consits of well insulated container equipped with electric heaters, motor and pump for circulating oil, thermostats

for maintaining oil temperature within certain limits and electric controls. Stationary heating tanks also are available in large range of sizes, with or without mechanical agitation.—**Youngstown Miller Co., Sandusky, Ohio.**

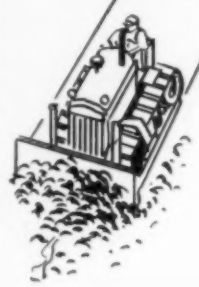
★ ★ ★

TWO TRUCK MODELS. KR-11 (double reduction drive) and KS-11 (2-speed rear axle) are now being built under governmental order for essential civilian users who qualify for new vehicles under priority orders. They are powered by Red Diamond engine which has 450.99 cu. in. piston displacement and develops 148 brake hp. at 2,600 rpm. Maximum

engine torque is 360 lb./ft. at 1,000 rpm. Both models are available in three wheelbase lengths (149, 161 and 197 in.) to meet varying needs of heavy-duty truck users. Standard equipment includes air brakes and 5-speed transmissions (overdrive or direct in fifth). Trucks shown, recently delivered to Huron Horine, of Picher, Okla., have special all-metal 16- and 24-ton capacity trailers with air-operated bottom dumps. Trucks are bringing in ore to underground hopper for Eagle-Picher Mining and Smelting Co.—**International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill.**



ADECO



NOZZLE TESTER

KEEP DIESEL ENGINES RUNNING AT PEAK EFFICIENCY

With this sturdy, portable, lightweight Adeco Nozzle Tester, any mechanic can easily make quick, accurate tests on injector opening pressure, spray pattern, etc. and detect stuck needle valves and leakage around valve seats. Adeco advantages have made this America's most widely used nozzle tester. Tests both large and small injectors, on bench or engine. Avoids costly delays and possible damage to engine. Keeps diesels operating at peak efficiency.

Write for new illustrated bulletin.

AIRCRAFT & DIESEL EQUIPMENT CORPORATION

4401 NORTH RAVENSWOOD AVENUE

CHICAGO 40, ILLINOIS

FOR SCALE-RESISTANT CONCRETE PAVING

ATLAS DURAPLASTIC*

Air-Entraining Portland Cement

QUICK FACTS

1. **Complies with current Federal and ASTM specifications.**

2. **Provides the proper amount of entrained air by intergrinding with the cement the precise amount of air-entraining material needed for satisfactory field performance.**

3. **Makes concrete more workable, more plastic, more cohesive, more uniform and more durable throughout.**

4. **Minimizes segregation and bleeding.**

5. **Requires less mixing water for a given slump.**

6. **Fortifies the concrete against the effects of freezing and thawing weather.**

7. **Renders the concrete highly resistant to scaling due to action of de-icing salts.**

8. **Tends to reduce manipulation scale.**

9. **Produces concrete that dumps, spreads, screeds and finishes more easily.**

10. **Called DURAPLASTIC because it makes concrete more durable and more plastic.**

In each of the installations pictured above, Atlas Duraplastic was used on the right lane; normal cement was used on the left lane. Note that in each case the left lane has scaled, but the right lane is practically scale-free after several winters of identical salt de-icing treatment.

MORE than three score paving installations in over a dozen states and cities have proved the advantages of this new cement. Its commercial announcement in 1943 followed more than five years of research and testing in the laboratory, in the manufacture of this cement, and on actual jobs. Some of these have now passed their fifth winter of salt de-icing applications and all are practically scale-free.

For further information on the use of Atlas Duraplastic, write to our Technical Service Bureau. Ask for reprints of articles from technical journals giving details of actual installations. Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Bldg., New York 17, N. Y.

• • •

OFFICES: New York, Chicago, Albany, Boston, Philadelphia, Pittsburgh, Minneapolis, Duluth, Cleveland, St. Louis, Kansas City, Des Moines, Birmingham, Waco.

**Trademark registered, U. A. C. Co.; all rights reserved.*

CM-D-6

ATLAS DURAPLASTIC CEMENT

A Universal Atlas Product

and He Will Give You

MAXIMUM LIFE'S WEAR at LOW COST

Because Mir-O-Col Hard Facing Rods have a deposited hardness of 54 to 57 Rockwell C scale combined with high red hardness, the life's wear of equipment parts hard faced with Mir-O-Col Rods may be increased several times over that of the original part that has not been hard faced.

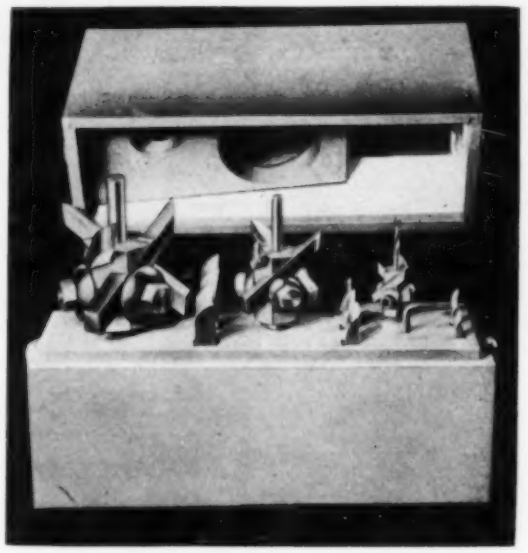
Keep operating speeds UP, maintenance costs and expensive service interruptions DOWN by hard facing with Mir-O-Col Rods those equipment parts subject to extreme conditions of wear from abrasion and impact.

Send for your free copy of the "Weldor's Guide to Successful Hard Facing."

MIR-ALLOY HARD FACING MAC RODS -COL COMPANY

2416-30 EAST FIFTY-THIRD STREET
LOS ANGELES 11, CALIFORNIA

THREE ADJUSTABLE HOLE CUTTERS, designed to cut holes in either thick or thin metals from ⅝ to 3½ in. in dia., have straight shanks for use as hand tools, in portable electric and pneumatic drills, or in light drill presses and are said by manufacturer to produce accurate, clean holes that require no after-grinding, reaming or filing. These cutters are adjustable, can be easily sharpened by any com-



petent mechanic and may be used in lathes and other spindle-type machines. They consist of a straight shank on a hexagon body into which are set three high-speed steel blades at 120-deg. intervals. Smallest of cutters has ⅜-in. straight shank.

First Get Valves Clean Then Repair or Reclaim

In reclaiming engine valves, FIRST remove carbonized oil and other deposits the THOROUGH Oakite way. Mechanics then can check fatigue cracks . . . see at a glance the work to be done. Equally important, it enables them to obtain the best results from the metallizing, welding or other reconditioning procedure employed. Electrolytic cleaning with one of several specialized Oakite materials available speeds this preliminary degreasing. Data FREE! Write TODAY!

24G OAKITE PRODUCTS, INC.
Thames Street, New York 6, N. Y.
Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE *Specialized* CLEANING

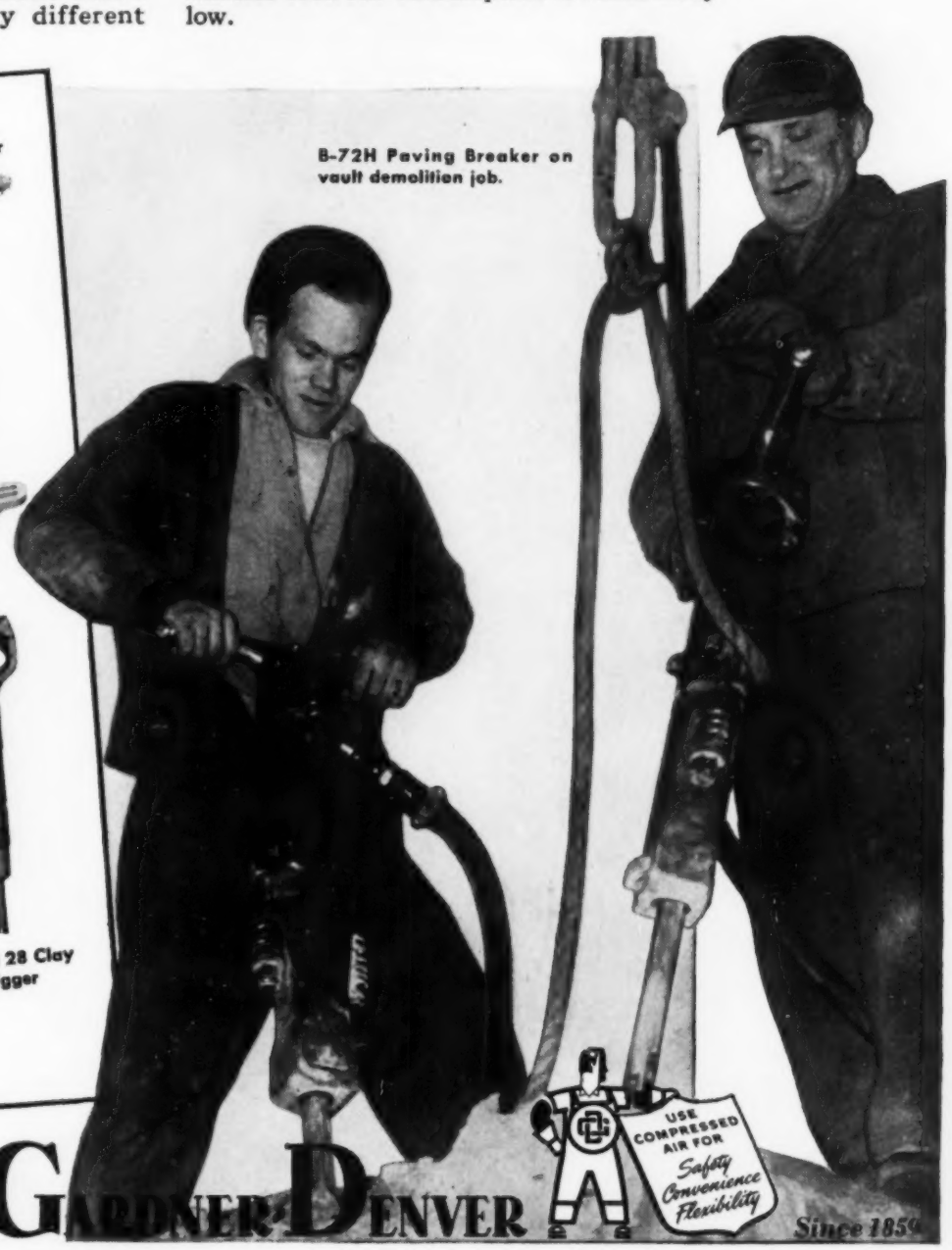
Every Blow a KNOCKOUT PUNCH

...yet this breaker is easy riding

A blow like a "knockout" punch . . . a fast, powerful blow that breaks concrete quickly and easily . . . that's the performance of a Gardner-Denver Paving Breaker.

Yet these paving breakers are remarkably easy to handle. Their perfect balance means less operator-fatigue . . . assures faster job progress. They hit slow, heavy blows with a follow-through that's entirely different from that of the usual pneumatic tool.

Gardner-Denver Paving Breakers are built for long life with low maintenance and maximum operator comfort. Handles are large and curved to fit the operator's hand. Air space between handles and head, and air inlet in cylinder instead of through backhead, keep handles cool. Air consumption is remarkably low.



For complete information on Gardner-Denver Paving Breakers and Clay Diggers, write Gardner-Denver Co., Quincy, Ill.

GARDNER-DENVER Since 185

Streamline
Your Mixing Operation with a JOHNSON
PORTO-BATCHER

Saves Time, Handling Equipment, and Truck Mixer Miles

• Eliminates the expense and time waste of long hauls. Easily towed to the most advantageous point in the pouring area, and quickly set up for fast, efficient operation. Meets all state highway requirements as to weight and over-all dimensions. Levers grouped in one central location making it practical for one man to control all batching operations.

Johnson patented charging skip provides pre-mixing and pre-shrinkage which compares favorably with the best results obtainable in modern permanent batching plants. This charging skip has a capacity of 33 cubic feet for aggregate and 10 cubic feet for cement. Batching cycle is 90 seconds. Gumming and excessive wear is eliminated because of effective intermingling of aggregate and cement by Johnson charger skip before the batch comes in contact with wet mixer opening and walls. Write for full details.

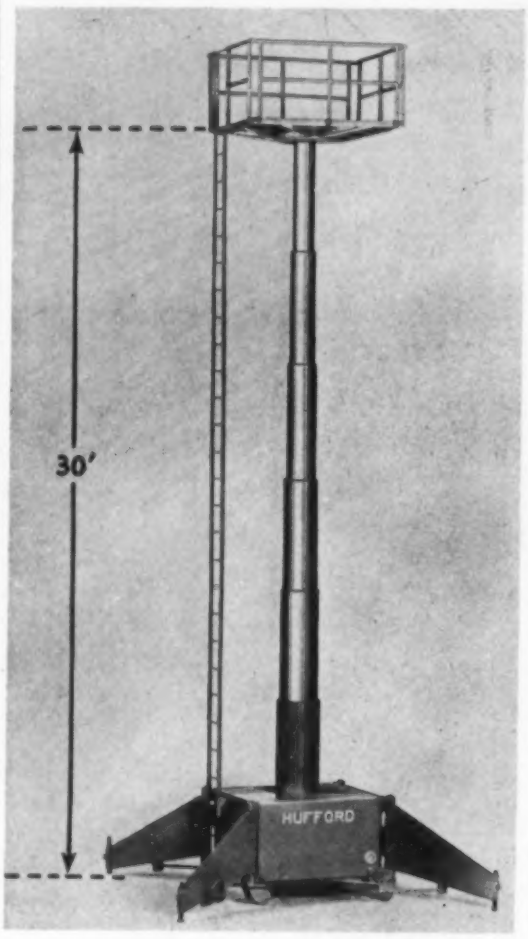
READY MIX PLANT
BULK CEMENT HANDLING EQUIPMENT
CEMENT STORAGE BINS
CONCRETE BUCKETS
BATCHERS

the C. S. JOHNSON COMPANY
CHAMPAIGN • ILLINOIS

cuts holes ⅝ in. to 1¼ in. in dia. and is equipped with a ¼-in. drill pilot. Second size has ½-in. straight shank and cuts all diameters of holes between 1 in. and 2½ in. Largest cutter has ½-in. straight shank and covers all diameters between 2 and 3½ in. Hardened and ground pilots on larger size tools are removable and may be replaced with lead drills if desired. Easy to set, requiring only steel rule for measuring distance from pilot to edge of each blade. Cutters with extra set of blades for each are packed in wooden box 3½x7¼x10 in. —**Robert H. Clark Co., Beverly Hills, Calif.**

★ ★ ★

PORTABLE HYDRAULIC ELEVATOR capable of lifting 3,000 lb. to a height of 30 ft. can be set up quickly anywhere inside or outside buildings where electric power is available. Consists of fabricated steel base, in which are carried hydraulic oil tank, pumps, motors, and valves, "outriggers," telescoping hydraulic cylinders, and 6x6-ft. work platform. Outriggers are hinged to base and all four must be in extended position before elevator will operate. They also provide means of taking weight off wheels and holding unit stationary during operation. Two front wheels are free swiveling, and all



four roll on Timken tapered roller bearings for easy portability. Hydraulic cylinders are built with high safety factor and are so designed that the load may be off center at any time without affecting operation or safety. If elevator is overloaded, sealed valve within steel base automatically prevents operation by shunting hydraulic fluid through return lines to tank. Simple three-button switch on platform permits easy control of elevator operation. Telescoping ladder extends with platform to full 30-ft. height. Unit lifts at rate of 20 ft. per min. when loaded, thus completing its extension to full 30 ft. in less than 90 sec.—**Hufford Machine Works, Redondo Beach, Calif.**

Sonotube
LAMINATED FIBRE TUBING FOR
Pier and Column Forms

Columns up to 14' and piers up to 10' heights are being successfully formed with SONOTUBE—the laminated fibre tubing. Cut to lengths on the job—that saves time—labor—money.

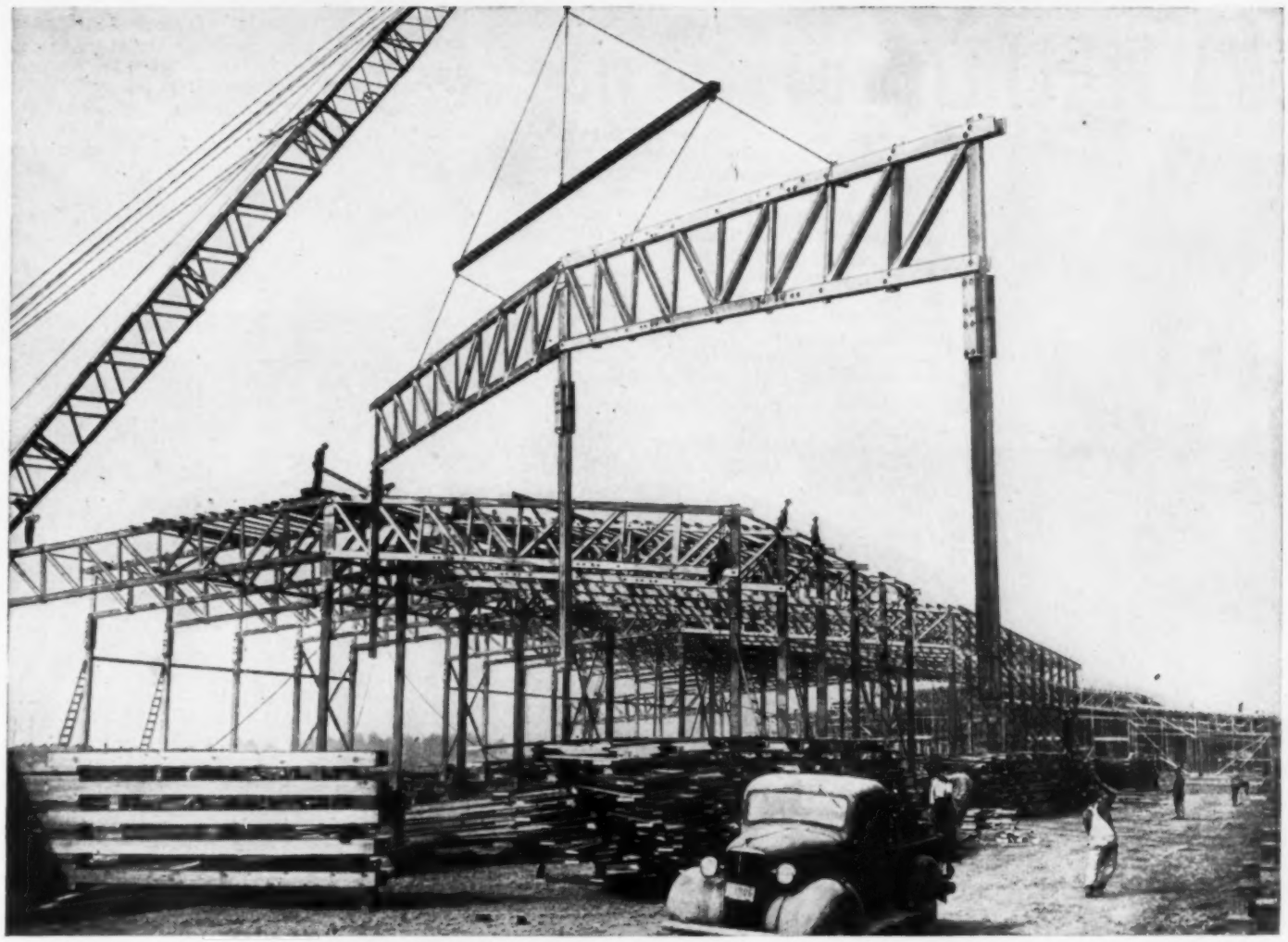
6 Standard Sizes

INSIDE DIAMETER					
8"	9"	10"	11¼"	12"	13½"
SQUARE INCHES					
50.26	64	78.54	100	113.1	144

Smaller sizes available.

ARMY E NAVY
WRITE FOR DELIVERED PRICES

SONOCO PRODUCTS COMPANY
HARTSVILLE, S. C. MYSTIC, CONN.
ROCKINGHAM, N. C. GARWOOD, N. J. LOWELL, MASS.



★ ★ *ARMY WAREHOUSES with 2,304 flat top roof trusses prefabricated and erected by Timber Structures, Inc. In all, 12 warehouses (200′ x 800′) were erected by a crew of from 50 to 75 men at an average time of 5 days per warehouse.*

ERECTION IS IMPORTANT

...BUILD WITH TIMBER STRUCTURES

The final test of Timber Structures service to contractors, engineers and architects is the efficiency with which buildings can be erected. All along the line, from first blueprints, through plant prefabrication, inspection, assembly and shipment to jobsite, every step must be coordinated so that erection requires a minimum of time, machinery and manpower. How well this is achieved is illustrated by these typical examples:

1. For an aircraft hangar, an 85′ boom mounted on Caterpillar traction was the only erection equipment needed for putting seven 162′ glued laminated roof trusses in place.
2. A shipyard mold loft 240′x 130′ was erected in its entirety in four 8-hour shifts.
3. Working hundreds of miles from civilization, a 420′ permanent timber bridge was erected on the Alaska Highway with efficiency and dispatch.

Key erection men are available from Timber Structures if desired. They are thoroughly familiar with erection procedure for all types of buildings.

Erection is but one feature of our "Engineering in Wood" policy. Others are research, design, engineering, prefabrication, inspection, transportation. All are responsible for the construction speed, economy, strength and permanence of roof trusses and other items furnished by us.

We invite inquiries as to work performed and as to our ability to serve you in timber and allied structural materials. Write for literature.

Engineering in Wood

TIMBER STRUCTURES
WARD MAYER
INCORPORATED
Portland 8, Ore. New York 17, N.Y.

SAFETY on the Home Front

M-B Motorless Marker striping factory aisle.

Reduce accidents to a minimum, both indoors and outdoors, by systematically striping designated traffic lanes. M-B MARKERS simplify the job. They handle ANY type of striping job — factory aisles, street centerlines, crosswalks, etc. Also handy for marking airports, athletic fields, tennis courts, playgrounds, etc. Quickly convertible to all-purpose paint sprayer for painting park benches, guard rails, traffic signs and other municipal equipment. Two types — motor-driven for all-purpose painting and motorless for striping only. Write for literature.

Meili-Blumberg Corp., Dept. CM-7, New Holstein, Wis.

M-B Motor-driven Marker putting down double line at street intersection.

M-B Motor-driven unit marking single line on airport runway.

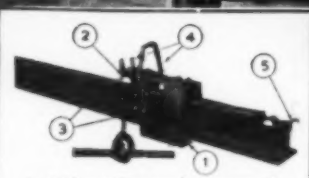
MB MARKERS

NEW MASTER VIBRATORY SCREED

Places up to 6,000 sq. ft. of concrete per hour!

THIS new vibratory finishing screed makes possible accurate strike-off and compaction of concrete slabs in one easy operation. *No additional vibration or floating is required.* Saves time and manpower in placing floors, aprons, runways, roads and service areas. Models: VS-6 ft.; VS-10 ft.; VS-13 ft.; VS-16 ft.; VS-20 ft.; and VS-25 ft.; all models adjustable for length. Wider widths or special shape vibratory screeds to your requirements. All vibratory screeds powered by economical 1½ HP variable-speed gas engines including Master Automatic Clutch.

Write for Bulletin 596 for complete details.



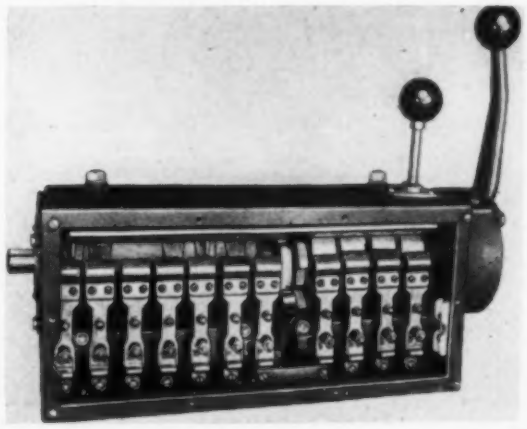
1. Adjustable spring mounted shoes
2. Two way draw
3. Easy adjustment for length
4. Yoke for lifting
5. Remote engine control

MASTER VIBRATOR COMPANY

Dayton 1, Ohio • Distributors throughout United States and Canada

Products Include: Concrete Vibrators Gas or Electric Surfacing Attachments, High Speed Tools • Vibratory Concrete Finishing Screeds • Rotary Concrete Floor Finishing Machines • Portable Gas Electric Generator Plants, 500 Watt to 17000 Watt, Voltage Regulators and Portable Mountings Optional • Master Flood and Shovel Lights • Electric or Gas Engine Driven Power Blow Hammers

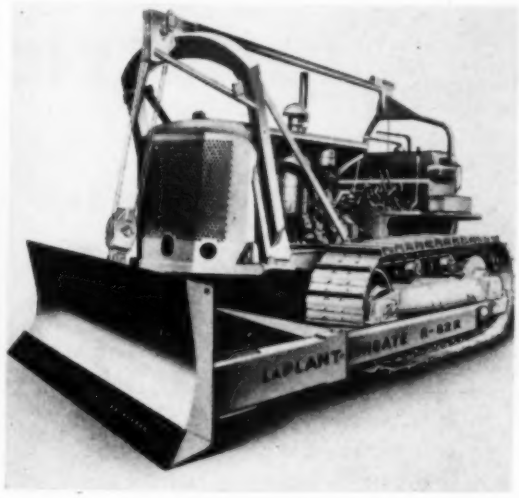
SIMPLIFIED FOUR-SPEED REVERSING CONTROLLER for electric and gas-electric trucks assures improved economy in current consumption by using resistance on the first speed only instead of on all three speeds in restricting motor current. An addi-



tional power saving also results by manipulating motor fields, connecting them in series on first and second speeds, which produces greater torque with less current consumption. Welded housing of new controller is dust-tight and meets all specifications for flash-proofing. M-79 Controller is installed on all Elwell-Parker electric or gas-electric low and high lift trucks in capacities up to 10,000 lb.—**The Elwell-Parker Electric Co., Cleveland, Ohio.**

★ ★ ★

POST-WAR EARTH-MOVING UNIT is new cable-operated bulldozer designed for mounting on Caterpillar D-8 tractor. Outstanding feature of this "Trailbuilder" is its simple and positive operation. Three-position blade can be angled either to right or left, or held in straight bulldozing position. Either end of blade can be tilted up or down with a variation of 14 in. while in straight bulldozing position as well as when blade is in



either angling position, this change being accomplished by pulling two pins. Blade can be raised a maximum of 50 in. or dropped 72 in. below ground line, through double drum power control unit of tractor, using single cable. Bulldozer is of welded steel construction, has box channel frame, box plate blade and pressed and formed sections. Cutting edge has been reinforced with more bolts compared with earlier models, while cutting bits are single plates formed to fit either end of blade for greater wear resistance in rock cuts. Front overhead is new design for increased strength and better appearance.—**LaPlant-Choate Manufacturing Co., Cedar Rapids, Iowa.**

ANNOUNCING!

The Greatest Forward Step in Electric Shovel Development

Here is a fresh concept in Electric Shovel Design.

Here, you'll miss much of the old conventional equipment — and many of the conventional sources of trouble. Here, for the first time on an Electric Shovel is the P&H *Magnetorque* Hoist Drive which does away with all friction clutches. Here also is the new *Directron* Control which eliminates all contactors—rotating regulators — exciters. It cushions all power impulses and reduces electrical equipment to a new minimum. Motors and generators are, for the first time, designed specifically for Electric Shovel operation.

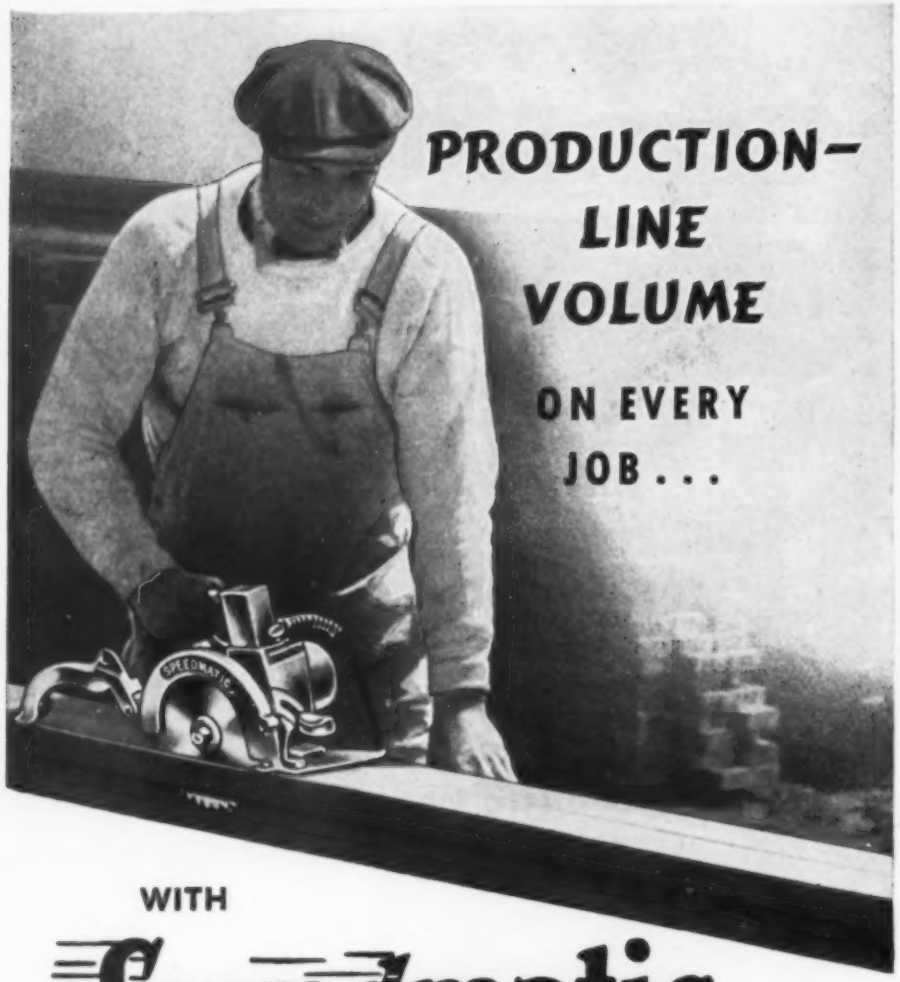
There are many other advancements in this new P&H Electric Shovel such as independent propel drive, positive steering control, worm type crowd, and filtered air cab. Mining and quarrying men, interested in more digging time, in greater tonnage and lower costs, should write us for full particulars.

P&H ELECTRIC SHOVELS

HARNISCHFEGER CORPORATION

EXCAVATORS · ELECTRIC CRANES · ARC WELDERS · HOISTS · WELDING ELECTRODES · MOTORS

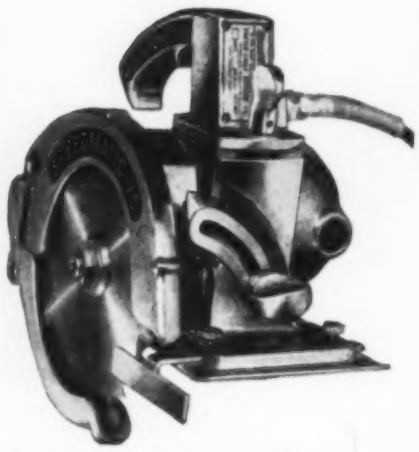
4494 West National Ave., Milwaukee 14, Wisconsin



WITH

Speedmatic

the portable electric handsaw designed for continuous use



Do your sawing the efficient way. Plan the job so that your SPEEDMATIC will be kept cutting every minute of the day. It's built to take that kind of treatment. The extra-capacity motor with the efficient, non-jam helical gear drive, deliver to the blade all the power you'll need to keep going at top speed from morning till night. Pre-cutting boosts the production of every man on the job—and SPEEDMATIC is the saw to keep the cutting ahead of them.

Other SPEEDMATIC advantages: perfect balance makes it the only truly one-hand saw, minimizing operator fatigue. The broad shoe sets it down securely and safely, even when tilted to cut at an angle. It's the easiest saw to use in vertical and other positions. Available in 7½", 8", 10¼" and 12" blade sizes.

FREE

DEMONSTRATION

Ask to see the SPEEDMATIC at work—then judge for yourself. There's no charge or obligation. Just phone your dealer or the local Porter-Cable representative (his name is in the classified 'phone book) or drop a post-card to us for full details. (Construction Methods—1920 American Builder—1721).

PORTER-CABLE MACHINE CO.
1920 - 7 N. SALINA STREET
SYRACUSE 8, N. Y.

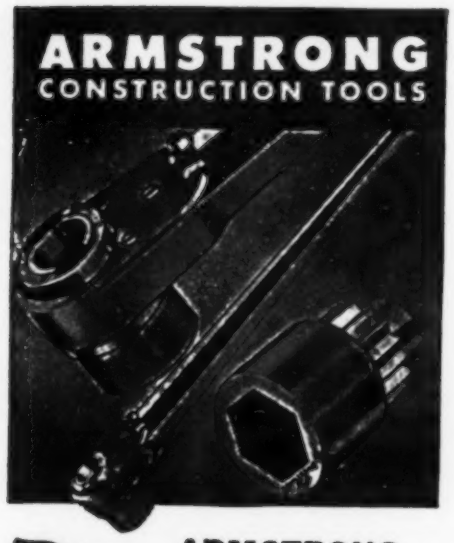
41 Centrifugal Pumps For War Emergency Pipeline

FORTY-ONE 20-IN. PUMPS have been supplied by Ingersoll-Rand Co. for the War Emergency Pipeline project known as the 20-in. Products Line which will parallel the 24-in. line known as the "Big Inch" and will carry finished refinery products, such as gasoline and fuel oil.

These pumps, which were especially designed for this job, are single-stage centrifugal units driven by 3,570-rpm., 1,500-hp. electric motors and operating against a total head of 825 ft. Three such machines in each pumping station will operate in series to produce final line pressure of 800 lb. per sq. in. This pressure is gradually reduced by friction between stations until section pressure at succeeding stations is about 30 lb. per sq. in. First pump in series of three builds this pressure up to 287 lb. per sq. in., second one to 544 lb. per sq. in., and third one to final pressure of 800 lb. per sq. in. Capacity of line will be 235,000 bbl. per day which is 6,855 gpm.

(Continued on page 114)

ARMSTRONG
CONSTRUCTION TOOLS

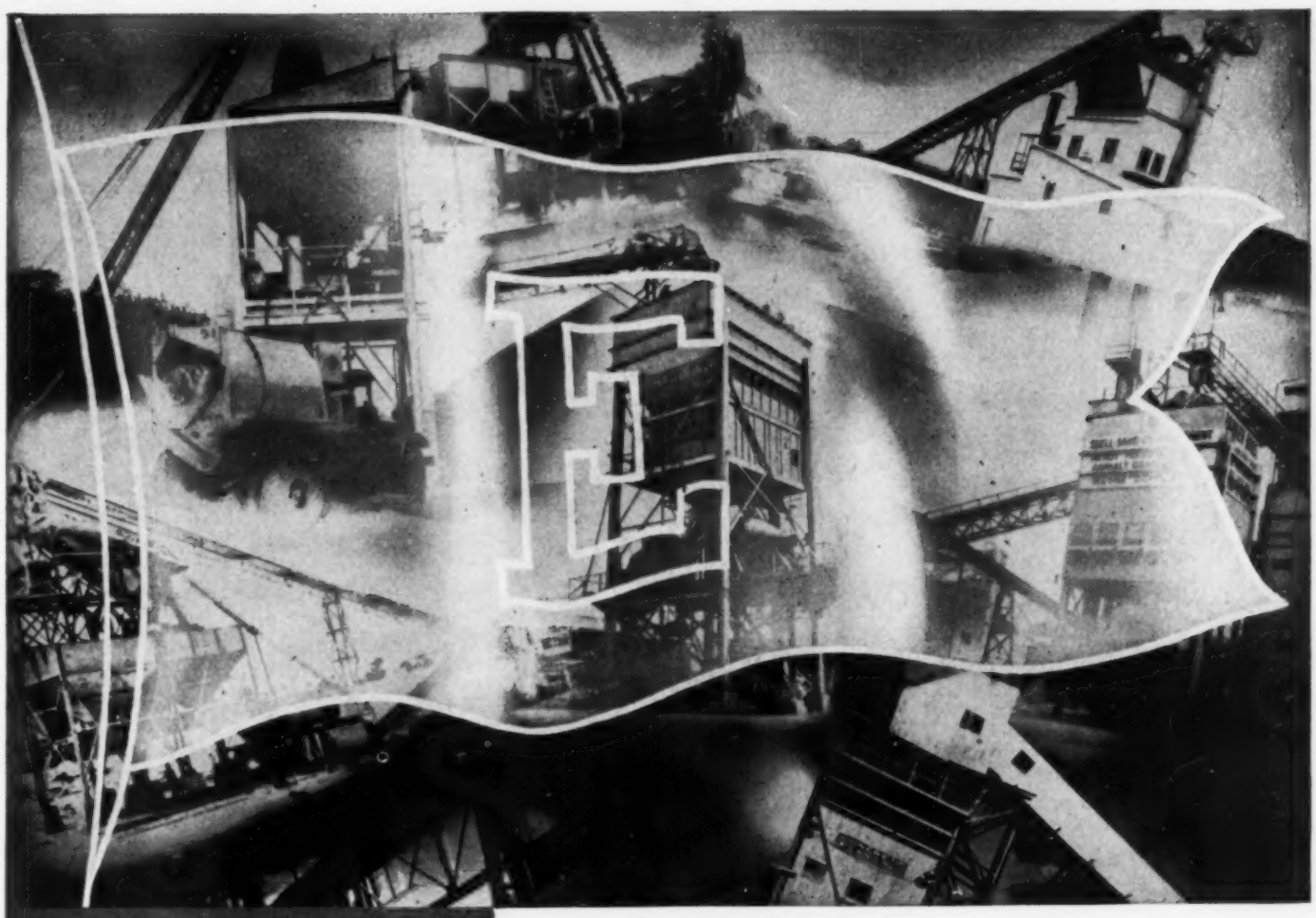


ARMSTRONG
DROP FORGED CONSTRUCTION RATCHETS

The ARMSTRONG Reversible Ratchet Construction Wrenches are made of steel thruout—the Ratchets are drop forged, the Nut Socket machined from special analysis bar steel. All parts except the handle are hardened. The spindle of the Ratchet is of "wide open" design—permits bolt to pass thru the Ratchet so that nuts can be run any distance along bolt and securely set with one setting. 24" or 36" Ratchets take square or hexagonal sockets for nuts of from 1" to 2⅝" dia. or 1⅜" to 3⅛" dia., respectively.

Write for Catalog

ARMSTRONG BROS. TOOL CO.
"The Tool Holder People"
334 N. FRANCISCO AVE CHICAGO, U.S.A.
Eastern Warehouse & Sales 199 Lafayette St. New York



these users of BUTLER EQUIPMENT
who have won the Army-Navy E*

Austin Company
W. S. Bellows
Brown & Root Co.
Cauldwell-Wingate Co.
Doyle & Russell
Henry Ericsson Co.
H. K. Ferguson Co.
George A. Fuller Co.
Great Lakes Dredge & Dock Co.
S. J. Groves & Sons Co.
Johnson, Drake, and Piper Co.
Peter Kiewits' Sons Co.
Long Construction Co.
Mahoney Troast Construction Co.
Manhattan Construction Co.
Maxon Construction Co.
McLean Contracting Co.
John McShain, Inc.
Merritt-Chapman & Scott Corp.
Raisler Corp.
Frederick Snare Corp.
J. Rich Steers, Inc.
James Stewart & Co., Inc.
T. Stuart & Son Co.
Turner Construction Co.
Virginia Engineering Co.
Walsh Construction Co.
Wigton-Abbot Corp.

BUTLER *Congratulates*

its friends and customers who have won the Army-Navy "E" Award — an honor given only for exceptional service in providing vital facilities for waging our global war.

The Butler Bin Company is proud of the part its equipment has played in the speedy completion of the projects of these outstanding construction firms; proud that efficient equipment teamed with efficient management helped to work production miracles.

No accident is the performance of this equipment. Every plant is an Engineered Design, planned to meet all local conditions and tailor-made for each job; efficient, trouble-free operation is built in.

Butler concrete plants, central mixing plants, aggregate plants, and road building equipment are now at work on vital war construction. Whether you are planning a war or post-war project, plan now to use Butler equipment; our engineers will gladly work with you in this first step toward Excellence in Production.

* We have tried to make this list complete to the best of our knowledge; but to any Butler equipment operators who have won the burgee whom we may have missed, our sincerest apologies.

BUTLER
BIN COMPANY
WAUKESHA, WISCONSIN

Amsco Renewable Lip Dippers Helped Avert Future Johnstown Floods

Johnstown, Pennsylvania at last has real flood control, as one of the "blessings" of war. The valley in which Johnstown lies has been the scene of periodic inundations, most remembered of which is the disastrous flood of 1889 when a dam impounding an artificial lake burst, nearly sweeping the town out of existence. It is said that the water traveled down the valley at 180 miles per hour. Since then, flash floods have often taken toll of property in this valley.

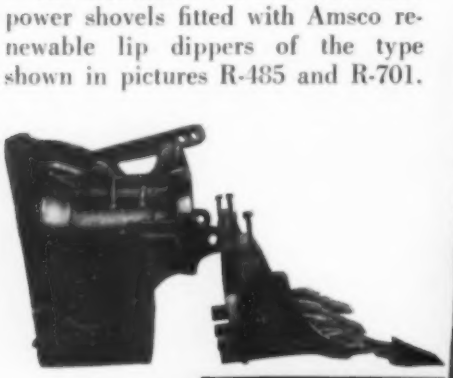
A number of war production plants are located in Johnstown, and uncontrolled floods might seriously hamper output. To avert damage, Stony Creek was widened and deepened, and paved slopes and concrete retaining walls were built in sections of it through the city. A total of 615,000 cubic yards of excavation was handled, much of it sand and gravel and the remainder blue laminated shale blasted from the channel bed and sides.

The excavation was done with three power shovels fitted with Amsco renewable lip dippers of the type shown in pictures R-485 and R-701. Spoil was loaded into trucks and hauled to a nearby ravine, which was filled to a depth of 60 ft. for a 3,000 ft. stretch.

Amsco renewable lip dippers were used on this and many other construction jobs so that when the lips—which receive the brunt of the wear—finally wore down beyond practical use, they could be quickly replaced. Internal "U"-bolts at each side tightly fasten the lip to the back casting, and lugs on the bottom edge of the lip fit and are fastened into corresponding slots in the front casting.

Made of manganese steel, "the toughest steel known," throughout, Amsco dippers afford maximum resistance to impact, abrasion and digging stresses—highly important where shot rock, tough shales or cemented gravels are being dug.

The evolution of the widely favored Amsco renewable lip dipper of today is described in Bulletin 641-D.



R 485

How Amsco Conservation Welding Rods Save — Bulletin 941-W.

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

AMERICAN Brake Shoe COMPANY

(Continued from page 112)

Pumps are so designed that two may operate in series or one may operate alone, if desired. With two pumps operating in series, line will deliver about 83 per cent of its rated capacity; with one pump about 55 per cent of rated capacity.

★ ★ ★

Lumber Restrictions To be Continued

TIGHTNESS OF THE LUMBER SITUATION precludes any possibility of relaxing present restrictions on construction for civilian purposes, the War Production Board announced recently.

"The lumber situation is serious and military requirements for 1944 are so great that any general expansion of civilian construction is unlikely this year," Roy W. Johnson, Director of the Facilities Bureau, War Production Board, said.

"The Armed Forces will need 70 percent of the estimated total lumber requirements for 1944, set at 34,000,000,000 b. f. according to figures released last week by the Lumber and Lumber Products Division, WPB," Mr. Johnson said. "Shipping lumber alone, used chiefly for crating and packaging munitions and supplies shipped to the war fronts will require 15,500,000,000 b. f.; the remainder will be used for construction for the Armed Forces, for railroads, utilities, mining and heavy industries, farms, war housing and other essential civilian requirements.

"In fact," Mr. Johnson pointed out, "the more successful we are on the fighting fronts, the greater will be the demand for lumber. As more men go overseas and operations expand, both military and rehabilitation in occupied areas, more lumber will be needed.

"Boxing, crating and dunnage call for about one-half of all the lumber that can be expected to be produced this year. It also is needed to rebuild ports, to expand and restore captured air fields and build new ones, to construct landing craft and hundreds of other military necessities.

Production Estimates

"Estimated production of lumber for 1944 is substantially below the anticipated requirements, and stockpiles are dangerously low. Every means must be employed, therefore, to adopt methods of construction that will utilize the least possible amount of lumber. Also, in ad-

(Continued on page 116)

IMAGINE A BIN-WALL *WINNING A BATTLE!*

PHOTO BY U. S. ARMY SIGNAL CORPS

You may not recognize them, but ARMCO Bin-Type Retaining Walls and other peace-time products are helping to swing the tide on the battle fronts. War has changed the shape of steel into tanks, trucks and ships that even now are saving lives and speeding Victory.

On the home front pre-war installations of ARMCO Retaining Walls are serving too—guarding strategic highways and railways for vital traffic. Here they have proved themselves the answer to unstable earth problems. Based on sound engineering design, these walls have demonstrated their ability to overcome unequal settlement without cracking or bulging.

Even though you may not be able to get sturdy ARMCO Bin-Type Retaining Walls for immediate construction, keep them in mind for after the war. You'll find them a practical solution for unstable slopes, right-of-way and similar problems. Write us for complete information. Armco Drainage Products Association, 655 Curtis St., Middletown, Ohio.

ARMCO ARMCO **BIN-TYPE RETAINING WALLS**

RIVETLESS SOCKET

Scoops
and
Coal Shovels

Another Exclusive "Ames" Improvement

FEATURES:

1—Smooth Socket..no sharp or rough edges.
2—Less chance of handle breakage.
3—Easy to rehandle.
4—Handle securely fastened to shovel by a rivet at frog.
5—Lower end of handle covered with metal cap which protects handle.

AMES Since 1774

"AMES" PRODUCTS
SHOVELS . . . SPADES
SCOOPS . . . FORKS
HOES . . . RAKES
POST HOLE DIGGERS
AGRICULTURAL HANDLES

AMES BALDWIN WYOMING CO.
PARKERSBURG, W. VA. • NORTH EASTON, MASS.

Fast, efficient Snap-on Tools for every service operation help keep vital equipment on the job . . . help speed construction by making short work of repairs and adjustments. From smallest service tool to Extra-Heavy Duty and Jumbo wrench sets the Snap-on line answers every hand tool need. Snap-on's direct-to-user tool service is available through factory branches in 37 principal cities. *Write for catalog of the complete Snap-on line.*

Snap-on Tools
THE CHOICE OF BETTER MECHANICS

SNAP-ON TOOLS CORPORATION
8084-G 28th Ave., Kenosha, Wisconsin

(*Continued from page* 114)

dition to lumber and other materials in short supply, such factors as availability of labor and increased load on the nation's transportation system must be considered.

"From the standpoint of lumber alone, however, since it enters so largely into most building operations, it is idle thinking that any relaxation of general restrictions on construction under Order L-41 can be made at this time," Mr. Johnson emphasized.

★ ★ ★

Design Trends in Diesel Engines

TWO TRENDS IN DESIGN AND APPLICATION during the war will accelerate Diesel engine use after the war, according to John Dickson, chief engineer in charge of development, Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich., said recently. First he cited the rapid trend toward the higher speed engines and, second, the equally rapid trend toward use of smaller, so-called high speed diesels in multiple installations in place of single, heavy, large slow-speed diesels.

"I am convinced," said Mr. Dickson, "that post-war power will be the engines that have been produced and developed during the war and will not be radical innovations suddenly thrust on the users of the engines as untried and undeveloped projects. These engines are of the high-speed type, compared with the larger and slower speed engine with which industry was, in general, more familiar prior to the war. Tremendous advances have been made in the production of diesel engines. The demand has necessitated mass production methods. This should make the cost of the engine relatively lower to the ultimate purchaser. It will enable the same unit engine to be used in multiplication of applications. The user will find it profitable to have in his tractors, scrapers, trucks, and other equipment the same engine adapted to meet the different applications.

"I am further convinced that the trend will be towards using a multiplicity of engines combined, in many cases, to a single drive shaft, to take the place of the large, single, slow-speed engine. This has been a very definite trend with our Armed Forces. Servicing parts should be relatively low in cost and readily obtainable—a factor which will reflect con-

(*Continued on page 118*)

There's been a big change

★ The game is the same—but look at the clothes! The principle of the tapered roller bearing hasn't changed, either—but Tyson has developed an *All-Rolls* design which has vastly improved bearing efficiency.

When Tyson found a way to add *thirty percent more rollers* around the raceway, they set a new pace for bearing strength and rigidity. They increased load capacity. In many cases, they *doubled* bearing life.

* * *

The big name in bearings today is . . . **TYSON!**

TYSON BEARING CORPORATION, MASSILLON, OHIO

COUNT THE ROLLS · THE ROLLS COUNT

Tyson

TODAY'S HEAVY-DUTY BEARING

★ BUY MORE WAR BONDS ★

RUGGED STRENGTH
SIMPLE DESIGN
Easy Operation
Positive Action
ECONOMICAL
—to operate
—to maintain

WARRINGTON-VULCAN
SINGLE-ACTING
STEAM
PILE HAMMERS

Drive wood, concrete, or steel piles this low-cost, dependable way. For almost 55 years the Warrington-Vulcan has been demonstrating its great ability on many important jobs in the United States and other countries. It operates at a medium steam pressure and delivers a moderate frequency of low velocity blows from a relatively heavy ram. Free from mechanical troubles, you are assured of regular and continuous action. Write for complete details.

VULCAN IRON WORKS
Since 1852
331 North Bell Avenue
Chicago Illinois

(Continued from page 116)

siderably on the ultimate earning power of the user's equipment.

Indicating the growth of Diesel production Mr. Dickson cited the fact that whereas the total diesel production in America in 1940 was four and a half million horsepower, more than fifteen million horsepower of one small series American diesel engine alone was produced in 1941, 42 and 43. He also cited the increase in horsepower, without increase in weight or size of this same engine, from 165 hp. before the war to 225 hp. today. "This same engine," he said, "has developed in laboratory tests over 300 hp., while diesel engineers can visualize the prospect of 450 hp. without depending on the increase of speed as a sole factor for this same size of engine."

★ ★ ★

New Injection Method Feeds Gasoline to Engines

GASOLINE INJECTION, a radically new method of supplying fuel to the cylinders of gasoline engines, has been perfected and is now in production, Donald P. Hess, President, American Bosch Corp., Springfield, Mass., announced recently. Higher efficiency, even with lower-grade gasolines, greater responsiveness, smoother power delivery and elimination of the fire hazard of an explosive mixture of gasoline and air in the induction system, are some of the advantages claimed for the new fuel distribution system. In his statement Mr. Hess cites the following features of the new method of fuel supply:

"The gasoline, by this system, is delivered uniformly to every cylinder of the engine. The result is that all cylinders 'pull' together in harmony, producing a smoother flow of power, and quieter engine operation than has ever been possible with any other method. The engine equipped with gasoline injection responds instantly to the touch of the throttle. Time lag is eliminated, acceleration is smoother, and the engine performs more surely under all conditions. Backfires are eliminated by this method, because the fuel, either in fuel or vaporized form, is confined within the engine cylinders. The air induction system carries air only, which is not mixed with the fuel until it reaches the cylinders.

"The dwindling oil resources of the nation lend special significance to the de-

(Continued on page 120)

COFFING HOISTS

"Safety-Pull" Hoist Pulling Concrete Forms

"Quik-Lift" Electric Hoist Speedily Moving Pipe

Model "YC" Spur Geared Hoist Moving Large Truck Motor

Write Today for Catalog DG 6

FOR SPEED
SAFETY
ECONOMY
DURABILITY

IN PRACTICALLY ALL LINES OF INDUSTRY COFFING HOISTS ARE PLAYING A PROMINENT PART IN SPEEDING UP
CONSTRUCTION
PRODUCTION
MAINTENANCE

COFFING HOIST COMPANY
Danville, Illinois, U. S. A.

25 Yards at a Time . . .

● That's the way the Northern Illinois Coal Corporation—one of the nation's larger coal strippers—removes overburden from its fields near Wilmington, Illinois.

Having achieved outstanding results with Page Automatic Dragline buckets, this Midwest firm has now standardized on Automatics and has in use 5,8,12,14 and two 25 cubic yard Page buckets, one of which is shown above.

These giant Automatic buckets proved more than a match for extra-tough overburden sometimes in excess of 80 feet deep, and produced yardage 'way beyond what was thought to be dragline possibilities with greatly reduced maintenance and operating costs.

PAGE

Automatic **DRAGLINE BUCKETS**

PAGE ENGINEERING COMPANY, CHICAGO 38, ILLINOIS

N-I-G-H-T becomes L-I-G-H-T by the switch of single letter. The switch on a Novo Generator Set can bring light to your night construction job. Flick a switch and forget the time of day.

Novo Generator Sets are job-designed for dependable, trouble-free service. The extra-capacity fuel tank and oil reservoir minimize service interruptions. A weather-proof switch-board, equipped with circuit-breaker, eliminates fuses and open switches. Novo's complete line of Generator Sets range from 1 KW to 10 KW, AC or DC. They produce plenty of steady, flicker-free power for lighting your job or operating small tools.

Don't let darkness put a dead-line on your work-day. Get a Novo Generator Set and change N-I-G-H-T to L-I-G-H-T.

You won't be "charged" for the "current" information on Novo Generator Sets. Let us send you Bulletin No. 505-A.

NOVO ENGINE COMPANY LANSING, MICHIGAN

NOVO ENGINE COMPANY, 214 Porter St., Lansing 5, Michigan

Send me the current bulletin, No. 505-A, on Novo Generator Sets.

Name_____

Address_____

City_____ State_____

(*Continued from page* 118)

velopment of gasoline injection. By the use of this system, all fuels, even lower grades, burn more completely and efficiently. Thus, a greater proportion of their potential power is delivered in the form of useful energy. Miles per gallon increase, cost per mile decreases."

Gasoline injection is described as a method of fuel delivery adapted from the diesel engine, in which fuel is delivered to the cylinders in much the same way. American Bosch has manufactured diesel fuel injection equipment for many of the leading American diesel builders for a number of years. Their experience with the diesel system, and many more years of work in the production of ignition systems for automotive and aviation engines, was drawn upon heavily in the development of gasoline injection.

★ ★ ★

First Million Tons Are the Hardest

SEVENTEEN YEARS and millions of tons of material to move! That's a long sentence on anybody's rock pile, but in this case it means service with merit for it applies to "General Ironguts," the first shovel ever built by The General Excavator Company, of Marion, Ohio.

"OLD IRONGUTS," first shovel ever built by The General Excavator Company, of Marion, Ohio, and still in service for Scioto Lime and Stone Company, Delaware, Ohio. Beside veteran shovel are W. A. Reaney (right), general manager of Scioto, and operator Verne Andrew (left) who has been "on the job" with General Excavator and Osgood Equipment for 25 yr.

And even after 17 yr. of service, this No. 1 General still is a long way from a "pension." In fact, when war came, in-

(*Continued on page* 122)

GET THAT MECHANICALLY ACCURATE FINAL FINISH

. . . with a Koehring Longitudinal Finisher, and you are *sure* that the finish is in exact accordance with the crown specifications. Surface errors . . . excess or shortage of concrete affecting thickness of slab . . . is immediately detected . . . finisher screed accurately follows the crown of the slab. Various widths highway slab, airport runways and aprons, are easily, quickly and accurately surface-finished with a Koehring Longitudinal Finisher.

KOEHRING COMPANY, *Milwaukee 10, Wisconsin*

. . . DEPEND ON YOUR KOEHRING DISTRIBUTOR

to help you keep your equipment operating. Care for your Koehring equipment NOW, so it will serve you tomorrow. Koehring distributors have genuine Koehring parts. Koehring parts warehouses are at your service.

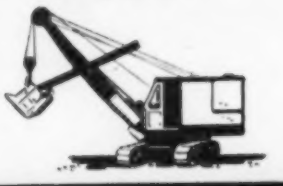
KOEHRING HEAVY DUTY

ARMY E NAVY

HEAVY-DUTY CONSTRUCTION EQUIPMENT

RIGHT AT HOME

digging rock and stone



YOU COULDN'T put this bucket on a tougher job. For years it has been helping deepen a ship channel,—digging in hard flint bottoms one day, handling rocks and stones on other days. Yet, because its lips and teeth are protected against rapid wear with Coast Metals Hard-Facing, it has been rendering outstanding performance.

Your bucket teeth, lips, runners and other parts also can be given a new lease on life by Coast Metals Hard-Facing! Or, better yet, hard-face your NEW bucket parts and they will serve ever so much better. Then, after slight wear, they can be rebuilt repeatedly and the cost and delay of getting replacement parts eliminated.

Write for "How To Make Construction Equipment Last Longer"

COAST METALS, INC.
Plant and General Offices: Canton, Ohio
Executive Offices: New York, N.Y.

COAST METALS *hard-facing weld rods*
MAKE YOUR EQUIPMENT LAST LONGER

Clipper
MASONRY SAWS
A special shape or shorter length need only be as far away as your Clipper Masonry Saw. The basic feature of Clipper is the new multiple cutting principle . . . . a method developed especially for Masonry Materials. You can be sure to cut with the fastest cutting speed and to obtain the longest blade life. Write for Catalog.
CLIPPER
MANUFACTURING CO.
4037 Manchester St ST LOUIS, MO

(Continued from page 120)

stead of retiring, it simply stepped up its capacity and worked harder than ever to set production records that would make any war worker proud.

It has been working rock continuously for the last 4 yr., providing enough material to keep a 7½-crusher plant busy at the Scioto Lime and Stone Co., Delaware, Ohio. Output averages 300 tons daily. Originally built as a ½-yd. machine, the No. 1 General has stepped up its capacity for the war-time emergency with a ¾-yd. dipper.

Absentee Record A-1

Emphasizing the rugged construction of this veteran is the fact that age has not served to slow down "Old Ironguts." One day recently it provided 20 truck loads (at 3½ tons per load) in 65 min. Its "absentee" record is also good, according to Verne Andrew, veteran operator, and W. A. Reaney, general manager of Scioto.

Lost time for "Old Ironguts" has been less than one day during the last year, they report, while maintenance costs and the need for repair parts have been slight, despite increased demands and the over-size dipper with which the veteran shovel is now equipped.

Scioto Lime and Stone is likewise a veteran in the field, having been founded in 1899 by James Reaney who is still active in the business and is the father of the present general manager. Total holdings include 780 acres with the present pit covering from 25 to 30 acres and the plant site 50 acres.

Chief customers of Scioto are steel plants and railroads. The company is also producing hydrated lime and Agstone for agricultural uses. Total production averages 700 tons daily of finished products.

* * *

Truck-Mixer Manufacturers Organize Standard Bureau

A TRUCK-MIXER MANUFACTURERS BUREAU has been organized by the equipment makers in that field under the sponsorship of the National Ready Mix Concrete Association. Formation of the bureau is the result of four years' effort on the part of truck-mixer manufacturers to form an association to deal with the technical problems of the manufacturers

(Continued on page 124)

HEY! LEAVE THAT "PUTT-PUTT" ALONE

No soldier, you don't have to monkey around with that Homelite Portable Gasoline-engine-driven Generator.

You don't have to check the oil level . . . the oil is mixed with the gasoline and fresh, clean oil sprays over all moving parts at each revolution. For the same reason, there's no need to shut-down the unit to change oil . . . there's no oil sump to collect sludge.

The engine is air cooled . . . so there's no water level to be checked.

No adjustments are required when the load on the generator changes . . . a simple built-in governor automatically keeps the engine at a constant speed.

When it comes to operating electric tools, floodlights, landing field marker lights, or even radio equipment . . . this simplicity of operation has proved an important advantage to all the branches of our armed services. Less time is required to keep the Homelite generators operating . . . more time can be given to the number one job . . . winning the war.

On construction work a Homelite Generator is used by a lot of different men for a lot of different jobs . . . the night gang uses it to operate floodlights . . . the day crew, for operating electric hand tools.

Therefore, a Homelite must be easily operated by anyone. *And it is.* No fussing around. No difficult adjustments. No manual attention. Just set it up . . . start it . . . and let it purr.

HOMELITE CORPORATION

PORT CHESTER, NEW YORK

DIXIES SAVE MAN-HOURS

Today when having each man on the job is critically important . . . Dixie's Portable Water Carrier with its modern individual paper service can help by reducing the problem of sick absenteeism.

Countless construction executives have already discovered that the use of individual Dixie or Vortex Cups does cut down the spread of germs from mouth-to-mouth. Discarding the old "bucket and tin dipper" eliminates the source of much of the contagion.

Paper Cups are being used so widely by the armed forces and war plants that there just aren't enough Dixie Cups to meet the demand. We will do the best we can to meet requirements carrying priority ratings.

Less Time Out

Precious time is also saved. Each man will find less reason to leave his job and stall away extra minutes. Used but once and thrown away, Dixie or Vortex Cups, are the intelligent answer to today's urgent need for man-hour economy.

Dixie and Vortex Cups are made at Easton, Pa., Chicago, Ill., Darlington, S. C. and Toronto, Canada.

DIXIE CUPS

DRINKING CUPS AND FOOD CONTAINERS

(Continued from page 122)

and users of truck-mixers. By-laws of the bureau limit its activities as follows:

(A) To effect standardization of truck-mixers with a view towards simplification and standardization of sizes and capacities as well as other mechanical standards associated with the manufacture and use of truck mixers.

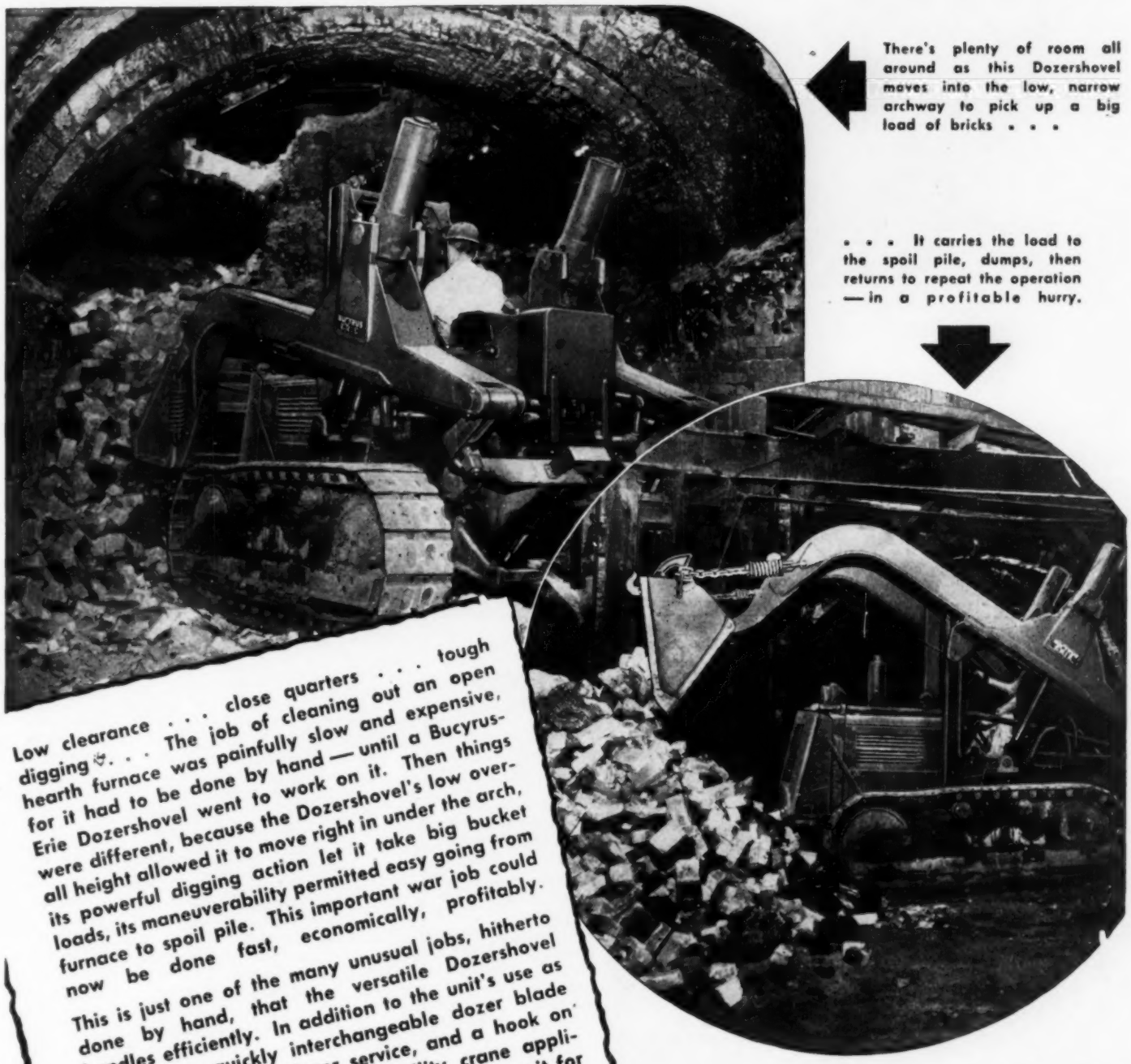
(B) To provide an organization through which the members of the bureau may join in giving suitable public notice, by advertising and in other ways, to its efforts to produce economies for the manufacturers and users of truck-mixers as well as for the general public.

The following firms are charter members: Blaw-Knox Co., Chain Belt Co., Concrete Transport Mixer Co., Jaeger Machine Co., Ransome Machinery Co. and the T. L. Smith Co. Officers include: H. C. Peters (T. L. Smith Co.), chairman; A. A. Levison (Blaw-Knox Co.) secretary; and T. H. Fleming (Concrete Transport Mixer Co.), treasurer.

A technical committee of the bureau consists of: L. G. Hilkemeier (Chain Belt), chairman; L. J. Sarosdy (Blaw-Knox); T. H. Fleming (Concrete Transport Mixer Co.); C. I. Bohmer (Jaeger); J. P. Faber (Ransome); and R. J. Barnes (T. L. Smith).

Keep ahead of Schedule
with
GATKE
High-Heat-Resisting
Asbestos
BRAKE MATERIALS
How do GATKE Brake Materials speed operations and save money? They keep operating and avoid delays. They pick up and release with smooth, positive, non-grabbing action for faster operation—require fewer adjustments.
GATKE Brake Materials are engineered and service proved for every brake and clutch of Excavating, Road Building and Construction Equipment. Just tell us what you need!
GATKE Brake Blocks and Frictions
Disc Type Clutch Facings
Cone Type Clutch Facings
GATKE MAKES
Brake Lining
Clutch Facings
Frictions
Non-Metallic Bearings
Sheet Packing
GATKE CORPORATION
226 N. LA SALLE ST.
CHICAGO 1, ILL.

The Bucyrus-Erie DOZERSHOVEL
GETS IN...AND DIGS!



There's plenty of room all around as this Dozershovel moves into the low, narrow archway to pick up a big load of bricks . . .

. . . It carries the load to the spoil pile, dumps, then returns to repeat the operation —in a profitable hurry.

Low clearance . . . close quarters . . . tough digging . . . The job of cleaning out an open hearth furnace was painfully slow and expensive, for it had to be done by hand — until a Bucyrus-Erie Dozershovel went to work on it. Then things were different, because the Dozershovel's low overall height allowed it to move right in under the arch, its powerful digging action let it take big bucket loads, its maneuverability permitted easy going from furnace to spoil pile. This important war job could now be done fast, economically, profitably.

This is just one of the many unusual jobs, hitherto done by hand, that the versatile Dozershovel handles efficiently. In addition to the unit's use as a shovel, a quickly interchangeable dozer blade permits full-fledged dozer service, and a hook on bucket or blade provides for utility crane application. Get the complete story of this new unit for T9 and TD9 International TracTracTors from your International distributor.

N-65

BACK THE ATTACK!

BUY WAR BONDS

BUCYRUS ERIE TRACTOR EQUIPMENT

SEE YOUR INTERNATIONAL TRACTRACTOR DISTRIBUTOR

NEED A POWER GRADER?

WARCO

has some available, subject to prior releases or Government requirements. Can ship promptly upon receipt of order with WPB-1319 Release.

W. A. RIDDELL CORPORATION
Bucyrus — Ohio

ARMY E NAVY

Write for literature on MALLSAWS, MALL Gasoline Powered and Pneumatic Chain Saws in 24", 36" and 48" sizes, Gasoline Powered, Electric and pneumatic Concrete Vibrators, Electric Surface Planes and Drills.

MALLSAWS "pay-off" on all types of concrete form construction above and below grade by:
REDUCING SAWING TIME—due to high speed and power—plus multiple cutting of like members at one time.
ASSURING SQUARE BOARD ENDS—that eliminate fins and projections.
SALVAGING WASTE LUMBER for spreaders, stoppers and bracers.
MALLSAWS are powered beyond ordinary requirements. They are fast and efficient for cross-cutting, ripping, beveling, pocket cutting and other sawing jobs. MALLSAWS also cut metal, cut and score concrete, tile, and stone with an abrasive wheel. They are perfectly balanced for use with either hand. Safety guard on all models.

MALL TOOL COMPANY, 7757 South Chicago Avenue, Chicago 19, Ill.

*Ask Your Dealer for Electric MALLSAWS TODAY

Mall REG. U.S. PAT. OFF. PORTABLE POWER TOOLS

NEWS FROM MANUFACTURERS

About Their Products

The publications reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

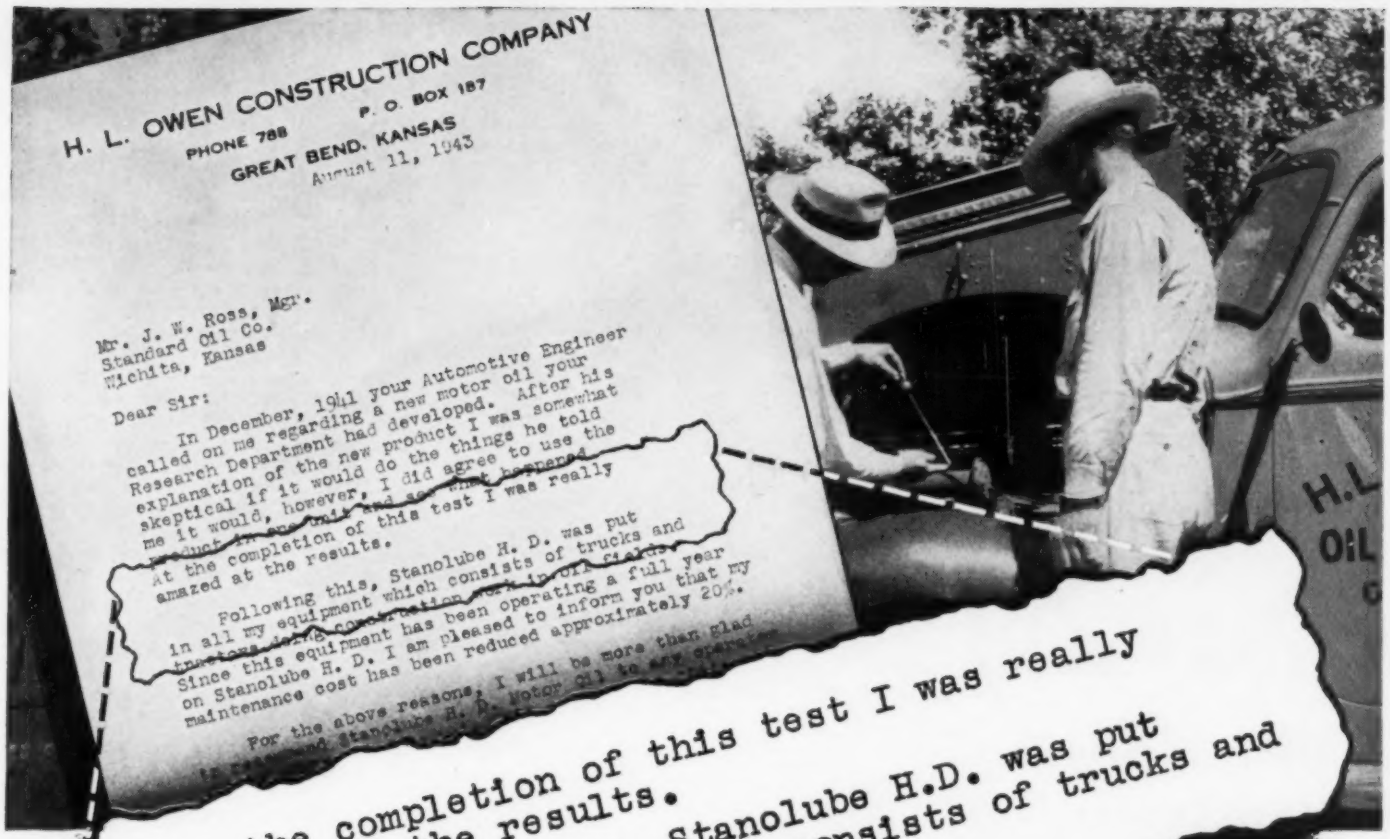
SELF-PRIMING CENTRIFUGAL, DIAPHRAGM AND PLUNGER PUMPS—**Marlow Pumps,** Ridgewood, N. J. (80 pp., illustrated) Give pertinent information, with photographs, on complete line of Marlow pumps with engine and pump specifications for each unit. Models run from 1½ to 10 in. and are supplied for use in manhole operations, rock, dirt and clay foundations, open ditches with large and small seepage, bridge pier caissons, wellpoints, jetting, sewage, sludges and semi-liquids, industrial clear liquids, mine gathering, strip mine dewatering, flood and other dewatering, irrigation, marine, oil transfer and fire fighting. Subjects covered: (1) Selection of Proper Type Pump for Certain Job; (2) Pros and Cons for Pumps; (3) How to Select Correct Size Pump; (4) Definitions, Formulas and Other Information.

★ ★ ★

ADJUSTING SAFETY GOGGLES—**American Optical Co.,** Southbridge, Mass. (16 pp. illustrated) Booklet entitled "Right on the Nose," explains in detail quickest and easiest methods of adjusting non-prescription industrial safety goggles so that workers can wear them in comfort. Prepared for safety directors, medical directors and other persons assigned job of fitting goggles. Object of booklet is to help prevent eye accidents caused by workers refusing to wear safety goggles because they are improperly fitted and therfore uncomfortable to wear. Training film, 16 mm., on same subject and bearing same title as booklet is available for loan by those interested. Free copies of the booklet may be obtained upon request.

★ ★ ★

PORTABLE SAW—**DeWalt Products Corp.,** Lancaster, Pa. (6-p. brochure, illustrated) Describes and illustrates salient features of portable power unit available in capacities of from 1½ to 3 hp., equipped with direct drive motor standard a.c., 60-cycle, 3,600 rpm. (idle) and 3,425 rpm. (load) and with ball-bearing carriage to assure ease of operation. Lists advantages: Unusually low cost; quick change from stock to rip saw, dado machine, spindle shaper to meet seasonal or pattern changes; precision accuracy — saw travels on accurately machined tracks inside arm; straight line production—no stoop, no squint to setup; dependable all-purpose unit—for small shop it is said to save in equipment necessary to render maximum service, and for large plants it serves as quickly setup emergency machine.


H. L. OWEN CONSTRUCTION COMPANY
PHONE 788 P. O. BOX 187
GREAT BEND, KANSAS
August 11, 1943
Mr. J. W. Ross, Mgr.
Standard Oil Co.
Wichita, Kansas
Dear Sir:
In December, 1941 your Automotive Engineer called on me regarding a new motor oil your Research Department had developed. After his explanation of the new product I was somewhat skeptical if it would do the things he told me it would, however, I did agree to use the
At the completion of this test I was really amazed at the results.
Following this, Stanolube H. D. was put in all my equipment which consists of trucks and
Since this equipment has been operating a full year on Stanolube H. D. I am pleased to inform you that my maintenance cost has been reduced approximately 20%.
For the above reasons, I will be more than glad
H.L
OIL

At the completion of this test I was really amazed at the results.

Following this, Stanolube H.D. was put in all my equipment which consists of trucks and

• IN TEST AFTER TEST, by fleet owners themselves, Stanolube H.D. works out just as H. L. Owen of Great Bend, Kansas, describes in his letter.

First, operators find it hard to believe that Stanolube H.D. will keep engines as clean as claimed for it. So they test it in one unit. Then, seeing the results, they put it in all equipment. And, sooner or later, they report a substantial saving in engine maintenance.

Here's why Stanolube H. D. keeps engines cleaner

Stanolube H.D. is a heat-proofed oil. That is, it is inhibited against oxidation. It reduces to a minimum troublesome types of deposits—varnish and oxidation sludge.

Gasoline Powers the Attack—Don't Waste a Drop!

The detergent quality of Stanolube H.D. prevents the accumulation of fuel soot, dirt, and the small amount of oxidized oil which may form from depositing in the engine. These potential deposit formers are held in suspension in the oil until they are removed by draining.

Test Stanolube H.D. in one of your hard-worked pieces of fleet equipment. Ask the Standard Oil Man who calls on you for results of similar tests in fleets near you. For more information about Stanolube H.D., call in a Standard Automotive Engineer. Write Standard Oil Company (Indiana), 910 S. Michigan Avenue, Chicago 80, Illinois, for the Engineer nearest you. In Nebraska, write Standard Oil Company of Nebraska at Omaha 2.

★ *heat-proofed* **Stanolube H. D.** ★

STANDARD OIL COMPANY (INDIANA) STANDARD SERVICE

★ **FLEET CONSERVATION SERVICE**

HYDRAULIC TORQUE CONVERTERS—**Twin Disc Clutch Co.,** Racine, Wis. and Rockford, Ill. (16 pp., illustrated) Facts about the function, operation and installation of these converters are concisely presented in a booklet published to help machine designers, manufacturers and users to obtain a clearer understanding of the capabilities of this modern method of gaining mechanical advantage between driving and driven units. A discussion of the hydraulic torque converter's purpose is followed by an explanation of how the device works. Several models of the Twin Disc Hydraulic torque converter are described in detail and illustrated with photographs and drawings. Sufficient installation data is included to make the booklet a valuable aid in the planning of initial layouts and in drawing up the preliminary specifications for equipment on which these units are to be used.

★ ★ ★

PORTABLE WELD TESTING MACHINE—**Air Reduction Sales Co.,** 60 E. 42nd St., New York 17, N. Y. (18 pp., illustrated) Describes construction and operation of new and improved Airco unit, claimed to be the only portable type machine that performs all of these three weld tests: (1) Reduced section transverse tension test; (2) Guided bend test (a complete 180-deg. face or root bend); (3) Longitudinal all-weld metal tension test (0.505-in.). Stresses two advantages of machine: (1) Its ability to provide accurate data on tensile strength and ductility of weld specimens as determined by the three tests; (2) its relatively light weight which enables users to perform weld tests right on the job. This latter feature makes machine particularly useful for firms doing extensive field work such as pipe-line installations, construction and similar jobs performed in remote locations.

For Tight, Trouble-Free Air Hose Connections

Specify

"G J-BOSS"

GROUND JOINT

AIR HAMMER COUPLINGS

Designed and built to assure long, uninterrupted service, with maximum safety, on drills, hammers, spades and other pneumatic tools. Ground joint feature provides permanent soft-to-hard metal seal that cannot leak; also eliminates the time and trouble required for washer replacements. "Boss" Interlocking Clamp exerts a powerful grip that is proof against blowoffs.

Compact Type, Style XLB-61, ½" and ¾". Heavy Type, Style XHB-72, ¾" and 1".

NOTE: For washer type couplings of otherwise identical design, ask for "Boss" Air Hammer Couplings.

Stocked by Manufacturers and Jobbers of Mechanical Rubber Goods

DIXON
VALVE & COUPLING CO.
Main Office and Factory: PHILADELPHIA, PA.
BRANCHES: CHICAGO · BIRMINGHAM · LOS ANGELES · HOUSTON

Shunk

Superior Quality

BLADES
AND CUTTING EDGES

For any make of machine
Motor Graders, Maintainers, Scrapers, Drags, Bulldozers, Backfillers, Wagon Scrapers, Trail Builders, Trail Blazers, Carryalls. Also—

CUTTING EDGES
WEARING SHOES
RACE SLOPERS
EXTENSION BLADES
MOLDBOARDS
and
SCARIFIER TEETH

50 years of manufacturing blades has developed for you a special steel, milled through our own rolls and forged at the edges to give that extra wearing quality you need.

All widths lengths, and thicknesses, punched ready to fit your machine.

Consult your internationally recognized Blade Specialists. Write for special bulletins, giving type and name of machines you operate—get set for Blades early.

Shunk
MANUFACTURING COMPANY
Established 1854
BUCYRUS, OHIO.

Try them on your toughest problems!

For years the Hool and Kinne Library has been providing structural engineers with the facts they need *on every problem concerned with the design and construction of civil engineering structures.* This is a library that must be USED to be fully appreciated—that is why we want YOU to use it. We want you to forget the financial side of this proposition until you have solved some knotty problem that you may be up against—to find out how a specialist in that particular field would handle it. We want to prove to you that this library furnishes you with what amounts to the consulting services of 54 recognized structural engineering specialists.

HOOL AND KINNE'S

STRUCTURAL ENGINEERS' Handbook Library

With many newly revised sections containing up-to-the-minute STANDARDS and PRACTICE

THESE six books offer you the most complete compilation of structural engineering data ever published; they furnish you with genuinely professional information drawn from records of actual practice and written by a large staff of specialists.

They cover the how and why of foundation and substructure design and construction, the general theory of structural members, the detailed design of such members and the design of their connection with other members—they explain the principles of statics, reactions, moments and shears in beams and trusses, influence lines, methods of computing stresses in lateral trusses and portal bracing—they give details of design and construction of steel, timber, and concrete structures of all types.

Examine the Library for 10 days in your home or office

6 volumes, 3575 pages, fully illustrated.

McGraw-Hill Book Co., 330 W. 42 St., N. Y. 18

You may send me **Hool and Kinne's Structural Engineers' Library** for my inspection. If the books prove satisfactory, I will send $3.50 in 10 days and $3.00 per month until I have paid the price of the books, $27.50. If the books are not what I want, I agree to return them postpaid within 10 days of receipt.

Signature .....

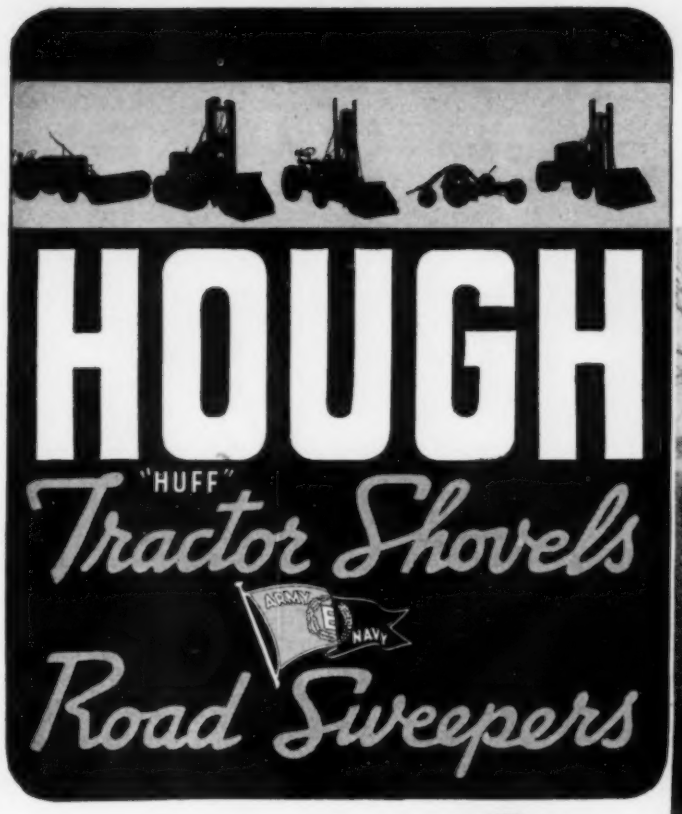
Home Address .....

City and State .....

Name of Company .....

Occupation .....

(To insure prompt shipment write plainly and fill in all lines.) C.M. 7-44



Smooth Operation—

a Feature of

Hough Cable-Operated Tractor Shovels

which imparts Speedier Handling, Greater Yardage and Lower Costs

Smooth, easy operation, made possible by proper weight distribution and sound engineering design, is a valuable characteristic of Hough Cable-Operated Tractor Shovels on International T-6, TD-6, T-9 and TD-9 Tractors. Owners report that operators have confidence in their machines, and have a welcome tendency to speed up the work, resulting in more material moved at a lower cost per yard.

Specifications include: automotive type main drive from engine crankshaft through hardened steel gears and propeller shaft equipped with universal joint; control lever raises, holds and lowers bucket; safety stop prevents overwinding cables; dumping clearance 7′; raising time of loaded bucket 9 seconds; lowering time only 2 seconds. Bucket capacity for T-9 and TD-9, ¾ yd.; for T-6 and TD-6, ½ yd.

Shipped completely mounted—ready for operation. Ask your International dealer or write for bulletin.

Can be converted to Bulldozer in less than 10 Minutes

The bucket can be readily removed and a bulldozer blade attached. Both straight and reversible blades are available. Blades are equipped with hardened reversible cutting edges. Mushroom type grading shoes are standard equipment. Blades can be quickly set for bulldozing straight ahead or angled to right or left. Ruggedly constructed for tough bulldozer service.

THE FRANK G. HOUGH CO.

Libertyville, Illinois

"Since 1920"

Over 3,500 Hough Tractor Shovels Now in Service

SISALKRAFT

The Concrete Curing Blanket That Protects War Goods Enroute to Fighting Fronts!

This picture shows SISALKRAFT in use about four years ago on a concrete job, preventing quick evaporation and protecting the newly poured concrete.

Today, SISALKRAFT is protecting deck loads of equipment, arms, ammunition and other war supplies. In the holds of our merchant marine SISALKRAFT is protecting shipments of medicines, foods and clothing from high humidity, rot and rough handling.

The very same qualities that made SISALKRAFT the Number One concrete-curing agent are the reasons why it now protects supplies enroute to our boys "over there."

Over 24 years of proven dependability, on thousands of concrete jobs, won for SISALKRAFT the distinction of being in the specifications of 40 State Highway Departments. Contractors have used it over and over again — finally using their "old" SISALKRAFT blankets to protect subgrades and materials.

The war record of SISALKRAFT shows that this scuff-proof, weather-resistant, tough material can take amazing punishment! When Victory is won SISALKRAFT will again be available. Put it *first* on your list for postwar work!

THE SISALKRAFT CO.
205 W. WACKER DRIVE · CHICAGO 6, ILL.
NEW YORK · SAN FRANCISCO · LONDON · SYDNEY

Manufacturers of SISALKRAFT, FIBREEN, SISAL-X, SISALTAPE AND COPPER-ARMORED SISALKRAFT

MOVING STRUCTURES—**Eichleay Engineering Corp.**, 33 S. 19th St., Pittsburgh, Pa. (12 pp., illustrated) Describes and illustrates the company's methods of moving buildings and other structures. Covers also installation of heavy equipment, relocation of machinery, shoring, rigging and foundation work. Specific examples of moving projects undertaken and completed include airplane hangars, 186-ton penstock pipe at Boulder Dam 327x65-ft. garage, 175-ft.-high blast furnace, 12,000-ton telephone building, grandstand, bridge, elevated tank, factories and residences.

★ ★ ★

SCAFFOLDING FOR EMERGENCY CONSTRUCTION—**Dravo Corp.**, 300 Penn Ave., Pittsburgh, Pa. (19 pp., illustrated.) Examples of how the Army and the Navy are using American tubular scaffolding for various emergency structures, such as unloading piers, heavy bridge supports, observation towers, water tank towers, unloading ramps, huts, shelters and storage bins are illustrated in Bulletin 743. Tubular members are erected with aid of interchangeable connectors, bases and right-angle and swivel clamps, using simple tools and unskilled workers for operations of assembly and dismantling. Lengths of steel tubing vary from 2 to 18 ft. Two tubular members may be joined by inserting in their ends an expanding connector. Detailed instructions are given for erecting basic tower.

★ ★ ★

PLASTIC-HOUSED PORTABLE ELECTRIC DRILL—**Independent Pneumatic Tool Co.**, 600 W. Jackson Blvd., Chicago 6, Ill. (16-p. brochure, illustrated) Covers history, development, features and specifications of Thor plastic-housed drill said to be materially lighter than conventional aluminum housed drills and to enable the operator to increase production. Also to be ruggedly capable of absorbing shocks and thus to contribute to prolonged "true" operation of the internal mechanism. Other advantages described: low thermal conductivity, increased safety, toughness and durability. New "Armored-in Plastic" model weighs only 3¼ lb. as against 8 lb. for the aluminum model and measures 8 3/16 in. as against 13 in. for the earlier model.

★ ★ ★

Z-METAL CHAIN BELTS—**Chain Belt Co.**, Milwaukee, Wis. (8 pp., illustrated) New catalog describes these belts made of Z-metal, a ductile ferrous cast metal with a high tensile strength (more than 30 percent stronger than good malleable iron) and a correspondingly high yield point. This material is exceptionally good for use in cast chain belts because of its strength and toughness enabling it to absorb shock loads and to resist wear effectively under tough operating conditions. Although not stainless, Z-metal resists corrosive action of many acids and alkalis which actively attack malleable iron or steel. Belts are made in many styles, types and sizes for every kind of drive and conveyor service.

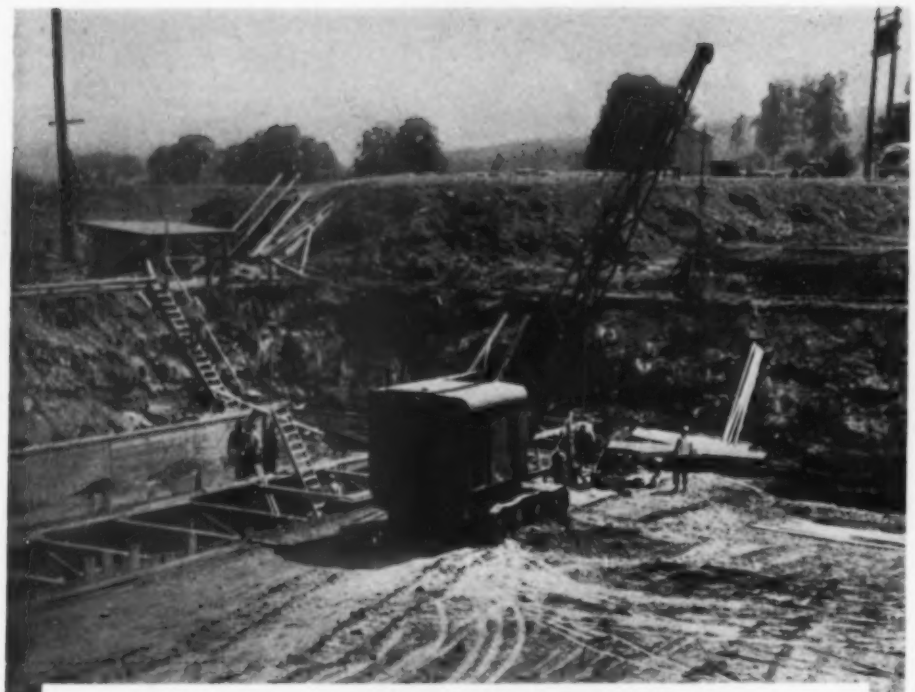
STABILITY FOR HEAVY LIFTS

Truck-like mobility has been an important feature of MICHIGAN convertible cranes and shovels, both in civilian and military use. But STABILITY is an equally important factor. Balanced design provides low center of gravity and low unit ground pressures for working on soft or muddy areas.

Optional outriggers give added stability for extra heavy lifts — contributing further to the broad working range of the MICHIGAN. Write for New Bulletin CM-74.

Rugged I-beam Outriggers (optional) slide out for instant use. Obtainable for center, for rear, or for both positions.

MICHIGAN
POWER SHOVEL COMPANY
BENTON HARBOR MICHIGAN



Here's Another Moretrench Job

going along in high — with a dry, safe foundation

On wet work MORETRENCH WELLPOINT EQUIPMENT pays dividends — cuts excavation costs. Plan to do your next wet job "in the dry" with a wellpoint system that's guaranteed.

MORETRENCH CORPORATION, 90 West St., New York 6

3037 So. Christiana Ave., Chicago 23, Ill. 321 Euterpe St., New Orleans 11, La.

SUPER-ABILITY of the Versatile 'DUCK'

Like the amazing duck that performs on land or water, Owen Dredging Buckets are designed to withstand the special difficulties of under water service or the most severe kind of digging on land. Protection of bearings against water and grit is a feature. Write for literature.

THE OWEN BUCKET CO.

6020 BREAKWATER AVE., CLEVELAND, O.

BRANCHES: New York, Philadelphia, Chicago, Berkeley, Cal.

OWEN BUCKETS

A MOUTHFUL AT EVERY BITE

JACKS—**Templeton, Kenly & Co.**, 1020 South Central Ave., Chicago 44, Ill. (60 pp., vest pocket size, illustrated) Data on Simplex lever screw and hydraulic jacks in sizes from 3- to 100-ton capacities. Booklet contains operating and maintenance instructions on all types of industrial jacks and includes listing of jacks by types for ready reference. Types of jacks include single-acting, automatic lowering, cable tensioning, pole-pulling, pipe-pushing, single and double acting track or trip jacks, journal jacks, ball-bearing screw jacks, steel shoring, steamboat ratchet and push-and-pull jacks.

★ ★ ★

GAS AND ELECTRIC WELDING SUPPLIES—**The Air Reduction Sales Co.**, 60 E. 42nd St., New York City 17, N. Y. (20-p. revised price list) Products in this list include gas welding rods made in a wide range of metals, types and sizes for all welding requirements. Other products listed and described are: hard-facing alloys, brazing alloys, fluxes, helmets, goggles, gloves, aprons, welding cable, cable lugs and ground clamps. In addition to prices, contents include detailed information of assistance to buyers, such as, sizes, dimensions, weights, stock numbers, forwarding data and recommended uses for products.

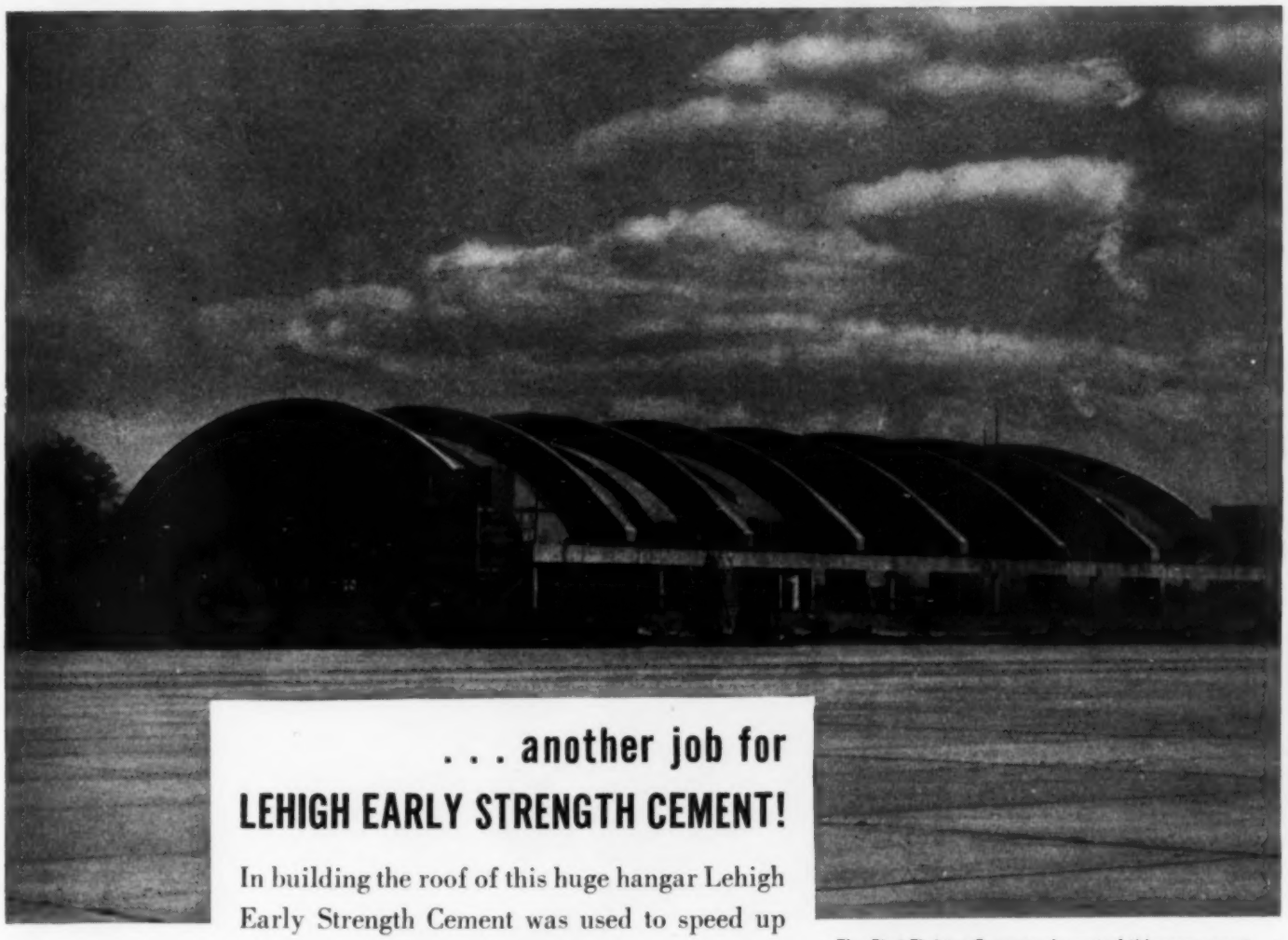
★ ★ ★

THREE-WHEEL ROAD ROLLERS—**The Galion Iron Works & Mfg. Co.**, Galion, Ohio. (20 pp. illustrated) Describes and illustrates two models: the Chief available in 10- and 12-ton capacities and the Warrior in 6-, 7- and 8-ton capacities, both supplied either with diesel or gasoline power. Lists functions such as compacting sub-base material, earth fills, scarifying, and rolling airport runways and top material. Explains thoroughly specific advantages of machine: (1) simplified operation; (2) dependable power; (3) heavy-duty transmission; (4) engine and transmission subframe and strong, rugged main frame; (5) front yoke and axle and rear axle and drive assemblies; (6) hydraulic or manual steering; (7) dependable hydraulic system; (8) smooth hard face rolls; (9) sprinkler system; (10) scarifier attachment; (11) canopy roof steel cab; (12) roll-a-plane attachment. Two pages of specifications on Chief and Warrior models.

★ ★ ★

POWER CENTERS—**Westinghouse Electric & Manufacturing Co.**, East Pittsburgh, Pa. (25-p. booklet) Describes and illustrates uses of these compact, coordinated unit substations available in all standard ratings and supplies a time-saving guide to the selection and specification of these units for indoor and outdoor installation, including coordinated disconnect and protective equipment. Standard arrangements are suggested to fit various types of distribution systems. With this booklet complete substations may be selected that will require no additional parts or protective vaults. Other advantages listed are minimum space requirements and added safety.

Build it to LAST . . . but build it FAST



. . . another job for LEHIGH EARLY STRENGTH CEMENT!

In building the roof of this huge hangar Lehigh Early Strength Cement was used to speed up construction. Each set of forms was removed in *three* days! With normal cement, *at least* seven days would have been required. Early removal and re-use of forms resulted in a sizable saving in forms cost. Furthermore, because the job was started in the winter-time, quick curing concrete also reduced danger of frost damage. And there was no waiting for scarce materials because "the makings" for concrete were always available.

On your very next contract, figure on Lehigh Early Strength Cement. If your figures are right, you'll find big savings—in construction time, in labor and in equipment costs. For expert advice, write to our Service Department.

The First Fighter Command wanted this permanent Air Base Hangar along the Atlantic Seaboard built in a hurry. Lehigh Early Strength Cement helped the Contractor—McCloskey & Co. of Philadelphia—to speed up the work. Engineers and Architects were Roberts & Schaefer Company, Chicago, Ill.

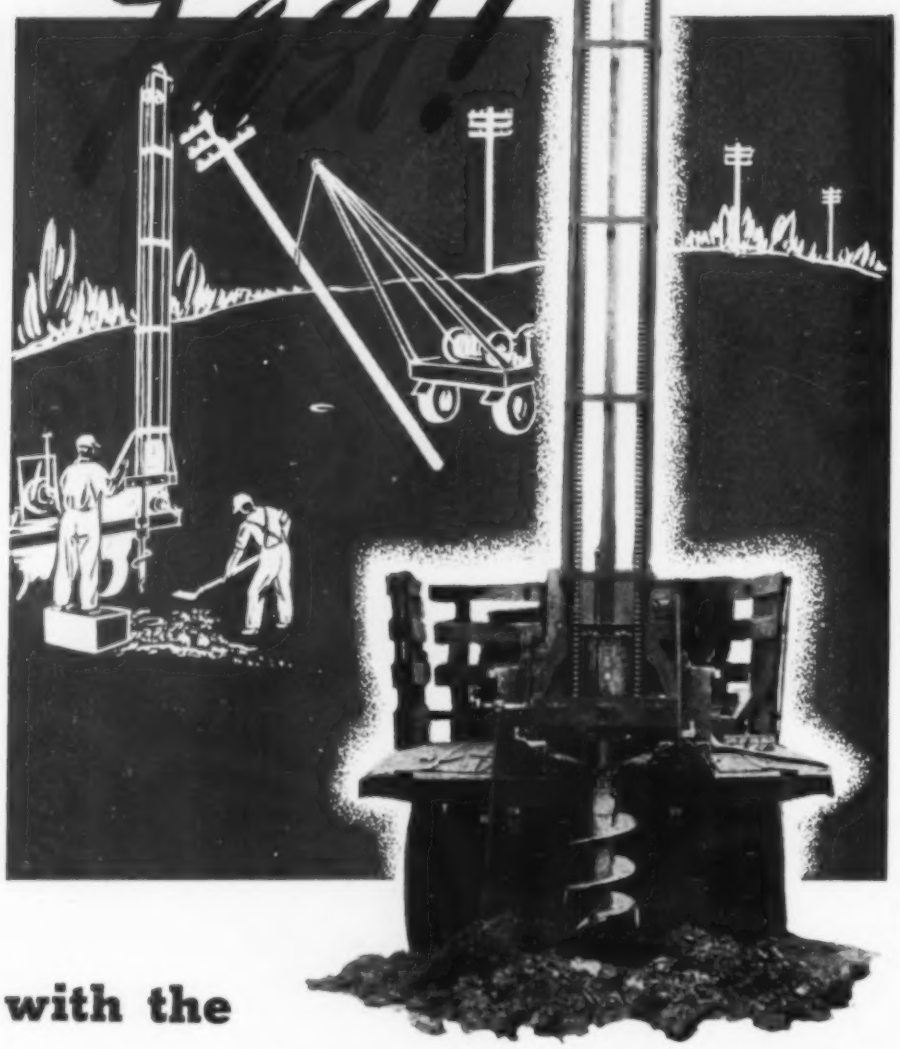
Lehigh CEMENT

LEHIGH EARLY STRENGTH CEMENT for **service-strength** concrete in a **hurry**

LEHIGH PORTLAND CEMENT COMPANY • ALLENTOWN, PA. • CHICAGO, ILL. • SPOKANE, WASH.

POLE-SETTING IS EASY

and fast!



with the

***Modern* BUDA EARTH DRILL**

Clean, straight, deep holes, even in tough soil, are made quickly and easily when you use the modern, economical, man-saving BUDA Earth Drill. Write or wire for bulletin.

BUDA

15425 Commercial Ave. **Harvey (Chicago Suburb) Illinois**

ROBOT OIL RECLAIMER—**The Youngstown Miller Co.**, Sandusky, Ohio. (4-p. folder) Bulletin YM-700 covers various features of this unit with capacities ranging from 4 to 300 gal. per hr., which employs the process which this company has used in batch oil reclaimers for more than 10 yr., with the added advantage that operation is now automatic and continuous. Capable of restoring all kinds of lubricating, hydraulic, cutting and vacuum pump oils so that the reclaimed oil can be re-used in the same manner and place as the new oil. Operators of diesel engines will find that a single Robot can take care of all their diesel engines, removing fuel dilution and moisture and keeping their engines clean.

★ ★ ★

CATERPILLAR PRODUCTS—**Caterpillar Tractor Co.**, Peoria, Ill. (20 pp., illustrated) Covers complete line of Caterpillar diesel engines, tractors and road machinery on earthmoving, agriculture, logging, mining, oil field and other power operations. Described and pictured are the important jobs these machines are doing and will continue to do on the home front. Moving earth, powering mines, village power plants, sawmills, service stations, boats and buildings and maintaining roads are all included.

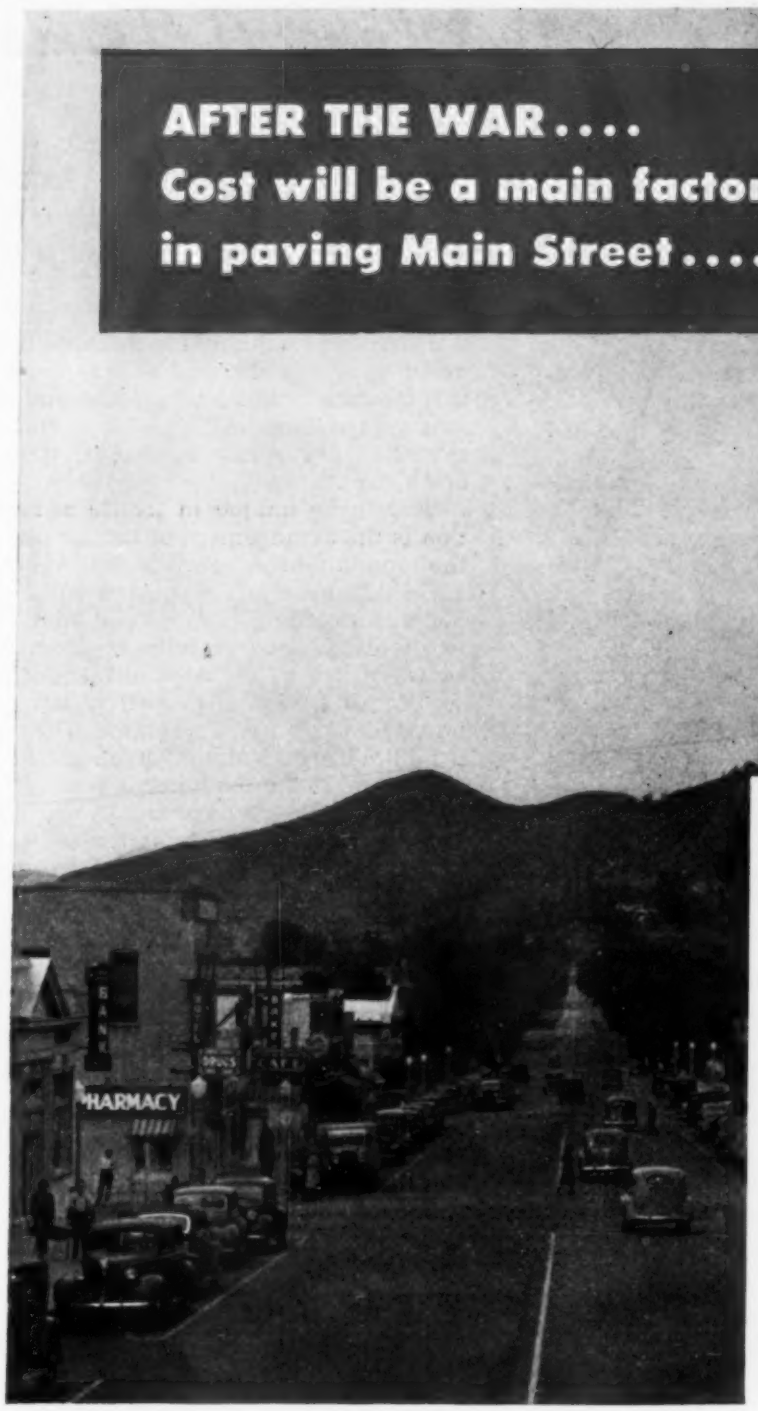
When There's No Time for Breakdowns It's Time to Get a Gorman-Rupp Pump

Today, when time is the essence, you need a Gorman-Rupp Self-Priming Centrifugal Pump more than ever. There is not a quitter among them. The water passage has the same area as the suction hose. Muck, gravel, cinders — you simply can't clog them because solids cannot accumulate. There is no recirculation orifice to clog — no shut-off valve to jam — no hand priming regulator. There isn't a self-priming centrifugal pump made that will outwork a Gorman-Rupp in gallonage or continuous hours. Gas engine or electric motor driven. Capacities up to 125,000 GPH. There is a type and style to fit your every requirement. Stock for immediate delivery in 100 principal cities.

THE GORMAN-RUPP COMPANY, MANSFIELD, OHIO

GORMAN-RUPP
Self-Priming Centrifugal Pumps

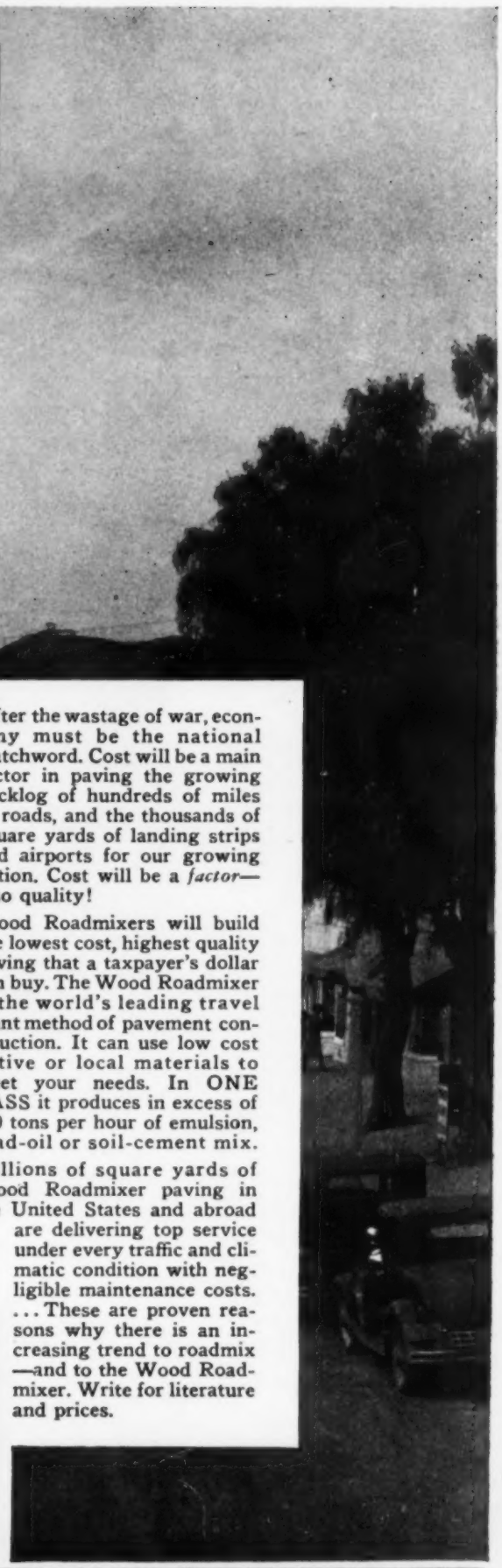
AFTER THE WAR....
Cost will be a main factor in paving Main Street....



After the wastage of war, economy must be the national watchword. Cost will be a main factor in paving the growing backlog of hundreds of miles of roads, and the thousands of square yards of landing strips and airports for our growing nation. Cost will be a *factor*—also quality!

Wood Roadmixers will build the lowest cost, highest quality paving that a taxpayer's dollar can buy. The Wood Roadmixer is the world's leading travel plant method of pavement construction. It can use low cost native or local materials to meet your needs. In ONE PASS it produces in excess of 250 tons per hour of emulsion, road-oil or soil-cement mix.

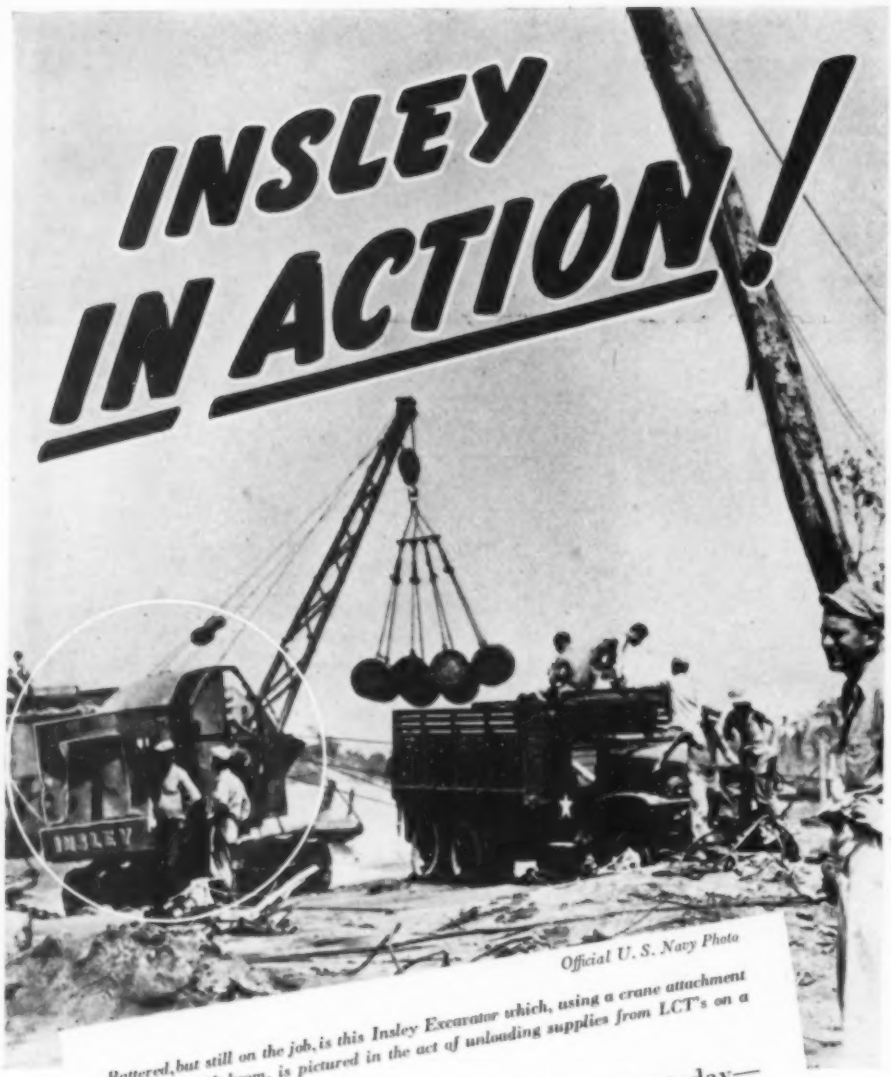
Millions of square yards of Wood Roadmixer paving in the United States and abroad are delivering top service under every traffic and climatic condition with negligible maintenance costs. ... These are proven reasons why there is an increasing trend to roadmix —and to the Wood Roadmixer. Write for literature and prices.



WOOD ROADMIXER—*A Complete Traveling Mixing Plant*

DESIGN FOR ROAD-MIX **WOOD ROADMIXER**

Wood Manufacturing Co. • 816 West 5th St., Los Angeles 13, California



Official U. S. Navy Photo

Battered, but still on the job, is this Insley Excavator which, using a crane attachment and make-shift boom, is pictured in the act of unloading supplies from LCT's on a South Pacific shore.

Wherever you find Insley Excavators in action today—and that includes every fighting front—you will find *fast action!*

Speed—far faster swings and dumps—has always been an outstanding feature of Insley equipment and this is one important reason why Insley's entire production is now going to the armed forces . . . because speed is the essence of victory.

After victory, when we are again able to provide Insley Excavators for your dirt moving and material handling jobs, you'll find that Insley's faster work cycle will be a vital asset . . . because speed, when it is backed with Insley's proved economy and dependability, is the essence of profitable performance.

EXCAVATORS • CRANES • BUCKETS • CARTS
INSLEY
CONCRETE PLACING EQUIPMENT

INSLEY MANUFACTURING CORPORATION
INDIANAPOLIS 1, INDIANA.

Long A-Frame Trestle

(Continued from page 71)

it 6 in., and tamping this mixture under the ties. The track was so improved by this treatment that a better line and surface was maintained by 3 or 4 laborers than had previously been done with 40 or 50 men.

Said to be unique in trestle construction is the arrangement of timber piles in the foundation. A concrete footing under each A-frame leg is supported on 12 timber piles, making 24 piles per bent. The two footings are connected by a concrete tie which takes the thrust of the legs. The timber piles were of treated yellow pine, unusually large and straight. They had a minimum diameter of 8 in. at the tip and 16 to 18 in. diameter 3 ft. from the butt. The piles, which are 50 and 60 ft. long, were driven at a batter of ½ and

(Continued on page 138)

National
Carbide
FLOODLIGHTS
VALUABLE IN PEACETIME

A NECESSITY NOW!

FOR ALL PURPOSES WHERE FLOODLIGHTS ARE REQUIRED.

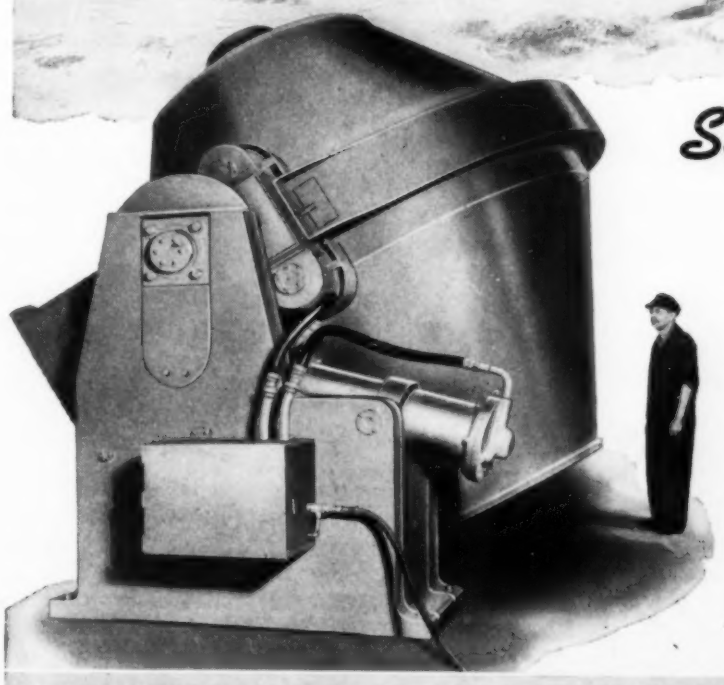
Simple in Construction
Economical in Cost
Dependable in Operation

Available in 1500, 8,000 and 16,000 candlepower units.

Write today for literature showing entire lines of Floodlights and Lanterns.

NATIONAL CARBIDE CORP.
60 East 42nd Street
New York 17, N. Y.

NC 200



Still Leading the Parade!

When experienced contractors and engineers are faced with the problem of producing mass concrete on scheduled time, they always use SMITH TILTERS. These dependable, modern mixers are available today, *better than ever*, built for big yardage and long life. Let SMITH Engineers solve your concrete problems. Write today.

THE T. L. SMITH COMPANY
2851 N. 32nd STREET MILWAUKEE 10, WIS., U. S. A.

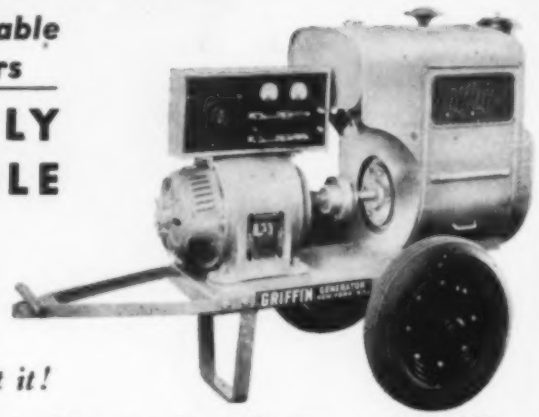
CONCRETE MIXER MANUFACTURERS SINCE 1900

A 4399-1P

One of the Dependable Griffin Generators

THOROUGHLY DEPENDABLE POWER and LIGHT

anywhere you want it!



MODEL 5-DR
Steel tired wheels during the rubber shortage

Gasoline engine is a standard well-known make; easily serviced; rugged; simple. Coupling is all-steel, running in a bath of oil. Generator is two-bearing, designed to take periodic overloads without damage. Two men can handle *anywhere* . . . one man, on a normally level surface. No gadgets to fool with. Just start the engine and plug in! Capacity 5 to 7½ K.W. If your job requires the operation of electric tools and motors or lighting, as, when, and where needed—here is your most economical equipment. It's one of the dependable Griffin products! Call or write for details.

Engineered and built to give you the same dependable Long Life as all Griffin products.

For Sale and For Rent Call Nearest Address

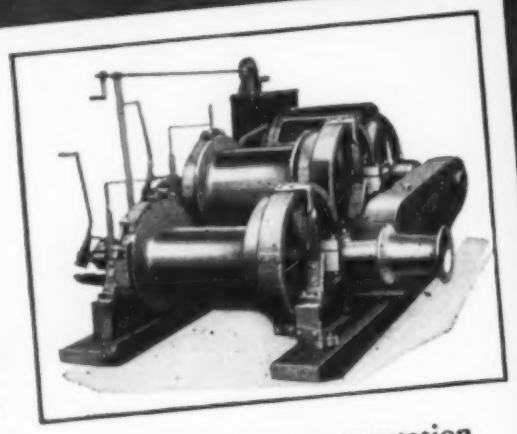
MID-WEST
GRIFFIN EQUIPMENT CO., INC.
548 Indiana Street • Hammond 1662
HAMMOND, INDIANA

SOUTH
GRIFFIN ENGINEERING CORP.
633 N. Myrtle Ave. • Jacksonville 5-4516
JACKSONVILLE, 4, FLA.

MAIN OFFICE: 881 EAST 141st STREET, NEW YORK 54, N. Y.

GRIFFIN EQUIPMENT
and Supply Corporation

Hoists to Fit the Job



Lidgerwood hoists have earned a 70-year reputation for dependability and efficiency *on the job*. There's a Lidgerwood gasoline, steam, electric or Diesel hoist to fit every construction need. When you need a hoist inquire *first* of LIDGERWOOD.

ARMY E NAVY

HOISTS FOR:
CABLEWAYS
INDUSTRIAL PLANTS
CONTRACTORS
MINES—DOCKS
RAILWAYS

LIDGERWOOD
ESTABLISHED 1873
Manufacturing Company
MAIN OFFICE AND WORKS • ELIZABETH, NEW JERSEY

(Continued from page 136)

¼ in. per ft. outward from the sides of the individual footings to increase the area of soil over which the load is distributed and to resist the longitudinal and lateral forces.

Monotube concrete piles were driven at least 10 ft. into firm sand, which required an average length of 91 ft. They were 18 in. at the butt and 8 in. at the tip. The metal shell of the piles was No. 7 gage.

Both timber and Monotube piles were driven with a 50-C Vulcan hammer having a 5,000-lb. ram, striking 120 blows per min. Soil conditions made this hammer more effective than the O-Vulcan hammer having a 7,500-lb. ram striking 50 blows per min. The longer interval between blows seemed to give the soil sufficient time to grip the piles.

Several observations were made in connection with piledriving. When the ground was covered with water, driving was much easier than when the surface of the gravel was dry. It was further determined that piles driven when water covered the ground developed the same carrying capacity under load tests as those driven when the ground was dry. Piles were driven from a bridge consisting of four steel girder beams 82 ft. long and 6 ft. c. to c. on self-propelled railway flatcars on the tracks of the side embankments. These girders carried a standard-gage railway track on which was mounted a self-propelled driver tower with the driver and its leads.

Forms

Steel forms were used for all members that were to be duplicated a great number of times, and wood was used for special members where only a few re-uses were required. The number of sets of forms was carefully worked out in accord with construction sequences, plant capacity, stripping periods and similar considerations. These re-uses made it possible to make attractive savings in critical construction materials and skilled labor.

There were six sets of footing forms and these were left in place 24 hr. after casting; 14 sets of combined column and cap forms which were left in place 5 days; and 28 sets of forms for deck spans which were left in place 7 days as a minimum and sometimes as long as 14 days, but no forms were stripped until the concrete attained the design strength of 3,000 psi.

All reinforcement bars were bent before shipping to the job. The bars for the footings were set and wired in place. Dowels for splicing to column steel were left protruding from the column base. For all members other than footings, reinforcing bars were assembled into appropriate units. The reinforcement for an entire deck slab was assembled into a

(Continued on page 140)

For large construction projects

TELSMITH

COMPLETE PLANTS

1,500,000 cu. yds. of aggregate for Norfork Dam.

● When it's a big job and urgent — there's usually a Telsmith sand and gravel or rock crushing plant. A complete plant, soundly designed by Telsmith engineers—with accurately balanced Telsmith-built machinery . . . completely adequate as to crushing, screening, classifying capacity . . . fast and flexible in operation . . . entirely dependable as to product quantity, quality and sizing. For reasons *why*—get Bulletin EP-10.

MP-4

1,500,000 tons of aggregate for Center Hill Dam.

West Mountain Plant serves many Pennsylvania projects.

1,000,000 yds. of aggregate for Delaware Aqueduct.

Large war projects in New England are served by this Telsmith plant.

SMITH ENGINEERING WORKS, 510 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N.Y.
211 W. Wacker Drive Chicago 6, Ill.
713 Commercial Trust Bldg. Philadelphia 2, Pa.
19-21 Charles St. Cambridge 41, Mass.
G. F. Seeley & Co. Toronto, Ont.
Mines Eng. & Eqpt. Co. San Francisco 4—Los Angeles 14
Brandeis M. & S. Co. Louisville 8, Ky.
Charleston Tractor & Eqpt. Corp. Charleston 22, W. Va.
Roanoke Trac. & Eqpt. Co. Roanoke 7, Va.
North Carolina Eqpt. Co. Raleigh & Charlotte, N. C.
Wilson-Weesner-Wilkinson Co. Knoxville 8 and Nashville 6, Tenn.

(Continued from page 138)

single unit and set in place by the gantry. Concrete spacer blocks were attached to insure proper clearance with the forms.

For concreting, two big gantries, each consisting of four trestles in pairs, were carried on a special flatcar mounted on two railway car trucks on about 25-ft. centers longitudinally. Seven handling hooks could be operated at one time from each gantry. Four concreting batch cars were mounted on a standard railway flat car and filled after spotting them under the spouts of the batcher bins. Each car had 15 compartments and each compartment carried materials for 1 cu.yd. of concrete. The cement, sand and gravel were dropped on to a rubber belt conveyor, located under the bins just above the floor of the car and carried to the loading skip of a 1-cu. yd. paving mixer. The sand, gravel and cement ribbons from the compartments merged into one large ribbon on the belt. The concrete was discharged into a 1-cu. yd. rolling gate bucket mounted on wheels and set on rails under the discharge gate. This bucket was picked up by a hook from the gantry and whisked overhead to deliver its charge. Two buckets were kept in operation, one being filled as the other

(Continued on page 142)

THIS SAFETY CLIP
HOLDS WIRE ROPE WITH A
"FIST-GRIP"
Four flat bearing surfaces grip the rope without weakening or distorting it.
Rope ends stay straight, full strength, ready for use again.

THIS ORDINARY CLIP
HOLDS WIRE ROPE WITH A
"FINGER-PINCH"
Rope is crushed and bowed. Rope end is weakened and should be cut off for future jobs when clips are removed.
Strain is distributed unevenly on bowed rope when under tension.

WHY LAUGHLIN

"FIST-GRIP" SAFETY CLIPS

ARE MORE EFFICIENT

Notice how these clips are designed... with identical saddles against the "live" and "dead" ends of the rope and with flat sides. The greater bearing surfaces

1. protect the rope from damage.
2. deliver full rope strength with fewer clips.

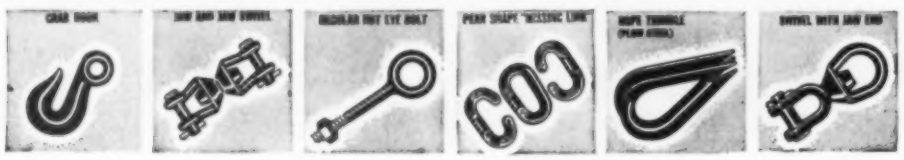
Unlike the ordinary U-bolt clip, Laughlin Safety Clips hold mostly by friction. No need to draw bolts so tight that the "live" end is squeezed into the saddle, kinking or crimping the wires . . . no need to apply the clips in one particular way.

Why chance accidents to your workers or damage to your wire ropes? "Fist-Grip" Clips are foolproof . . . they save men, materials, money. Send for free booklet.

FORGING A SHARE IN VICTORY

Distributed through Mill, Mine and Oil Field Supply Houses

THE THOMAS LAUGHLIN Company
PORTLAND 6, MAINE



For a "GOOD BUY" in SHOVELS

Ask for The ONLY SHOVELS with BLADE EDGES

GUARANTEED SPLIT-PROOF

INGERSOLL SHOVELS
"The Borg-Warner Line"

Write for Catalog and Prices
INGERSOLL STEEL & DISC DIVISION
BORG-WARNER CORPORATION
New Castle, Indiana
Plants: New Castle, Ind.: Chicago, Ill.: Kalamazoo, Mich.

PROTECTION FOR OPEN AND ENCLOSED GEARS

The periodical check-up with a feeler gauge tells the story.

With LUBRIPLATE Lubricants, the teeth of gears are absolutely separated by a load carrying film. Metal cannot touch metal. LUBRIPLATE lowers operating temperatures and seals the gears against rust and corrosion. Yet, in spite of its protective qualities, LUBRIPLATE does not cause drag. Even the most delicate, high speed gears operate better with it. LUBRIPLATE reduces friction to a minimum.

Yes, open and enclosed gears as well as chains, slides, sleeve and anti-friction bearings and all contacting parts last longer and require less power to drive them when lubricated with LUBRIPLATE. Let us send you a copy of "The LUBRIPLATE Film" that tells the whole story. It is written especially for your industry.

Rx FOR YOUR MACHINERY

No. 3—Ideal for general oil type lubrication. Ring oiled bearings, wick feeds, sight feeds and bottle oilers.

No. 8—Because of its high film strength and long life reflects outstanding performance in most types of enclosed gears (speed reducers).

No. 107—One of the most popular grease type products for general application by pressure gun or cups.

No. 70—For a wide range of grease applications, especially at temperatures above 200 degrees F.

No. 130-AA—Known nationwide as the superior lubricant for open gears, heavy duty bearings, wire rope, etc.

BALL BEARING—This is the LUBRIPLATE lubricant that has achieved wide acclaim for use in the general run of ball and roller bearings operating at speeds to 5000 RPM and temperatures up to 300 degrees F.

LUBRIPLATE DIVISION
FISKE BROTHERS REFINING COMPANY
NEWARK, N. J. **SINCE 1870** TOLEDO, O.
WRITE FOR THE NAME OF THE DEALER NEAR YOU

A COMPLETELY SELF-CONTAINED

Portable

MIXING UNIT

For Handling

COLD MIX MATERIALS

•

BUILT IN 4 SIZES

For 600 to 2500 Lb. Batches

For handling cut back, emulsion or similar cold mix materials, this H & B Model "M" portable mixing plant requires no additional equipment except a storage tank for the bituminous materials. The plant is furnished complete with folding elevator, weighing equipment, pug mill mixer, pump and power unit. Separate batch weighing of aggregate and asphalt insures accurate and uniform mixtures. All controls conveniently located for one-man operation. Bulletin M-44 will be sent on request. Also built in semi-portable type, without wheels (Model C). Bulletin C-44.

HETHERINGTON & BERNER Inc.

735 Kentucky Avenue • Indianapolis 7, Indiana

H&B Hetherington & Berner

BALANCED RODS... another "PLUS FEATURE" built into all

WISCONSIN *Air-Cooled* ENGINES

Every connecting rod, in every Wisconsin Air-Cooled Engine, is precision-balanced to eliminate all weight variations in excess of ¼-ounce per rod.

This is admittedly cutting it pretty fine for a rough-and-ready heavy-duty engine . . . but not *too fine* for these fine engines. Smooth operation, reduction of vibration to a negligible minimum, prevention of excessive wear . . . these are factors that can be controlled only by the most meticulous care and attention to such small details as this.

The *value* of this attention comes into play when a Wisconsin Air-Cooled Engine powers your equipment.

Most H.P. per pound

WISCONSIN MOTOR Corporation

MILWAUKEE 14, WISCONSIN, U. S. A.

World's Largest Builders of Heavy-Duty Air-Cooled Engines

(Continued from page 140)

was carried out. About 250 cu.yd. of concrete per day was placed by this method. One-half cubic yard from each cubic-yard batch was delivered into one column and one-half to its companion. No concrete was permitted to have a fall exceeding 30 in. As each ½ cu.yd. of concrete was placed, an air vibrator having a frequency of 7,500 impulses per min. was thrust in the concrete and allowed to submerge 4 ft.

In removing the deck forms, two large 24-in. I-beams were placed across underneath. The short end sections were unbolted and the main form allowed to rest on these cross-beams. These were lowered until the main form could be shifted to one side, where it was picked up by the gantry and moved to a new location. A set of deck forms could be removed and reset in a new location by a foreman and 9 men in 4 hr.

Material Requirements

Material requirements for the job included 736,640 lin. ft. of untreated timber piles; 19,400 lin. ft. of Monotube concrete piles; 50,404 cu.yd. of concrete; 10,250,535 lb. of reinforcing steel; 19,165 lin.ft. of steel handrails; 248,900 sq. ft. of dampproofing; and 6,880 sq.yd. of precast revetment paving.

The contractor's prices was $2,198,389, or $115.33 per lin. ft. of trestle completely ready to receive the track ballast. The structure was completed 17 months after it was begun and more than 6 months ahead of schedule.

* * *

Trenching Machines

(Continued from page 61)

its passage and leaves a channel in the clay. A second piece of steel, known as the expander, is trailed behind the mole to enlarge and finish off the mole channel.

In addition to forming a passage in the clay, the action of a mole drainer is to fissure the clay subsoil. The usual depth for drawing moles is about 24 in. Mole channels are sometimes drawn from a ditch, but it is considered preferable that the mole drainage system should be provided with "mains" in much the same way as a tile-drainage layout. These mains can be formed by the mole plow

(Continued on page 144)

LARGE SLED-TYPE BASE GIVES JACK solid and firm footing. Minimizes damaging, dangerous and temper-ruining tipping. Slide your Blackhawk into place quickly, easily — and positively.

CENTER LOAD

Blackhawk Jacks are designed to eliminate off-center strain and tipping—*look at the position of the saddle*—it's dead-center on the base—thus distributing the load evenly and safely—what's more, the serrated saddle has no overhang to shear off. The load is *always* directly in line with the piston!

PUMP-ON-SIDE FEATURE PERMITS convenient operation and full power from horizontal to vertical positions. The handle *always* extends toward the operator, not toward the floor giving you *extra* utility for shop jobs.

TAKE A *Load's-Eye* VIEW OF A BLACKHAWK JACK!

LOOK at this *business end* of a Blackhawk Jack — trim as a *battle-wagon* readied for *the* fight — stripped of all breakable non-essentials — designed to assure automatic *centering* of the load! Just as good as it looks — *and tough!* That's why Blackhawk Hydraulic Jacks are the choice of industry. *Only* Blackhawks carry the "Service-Proved" Seal that is your guarantee of safety — dependability — utility — satisfaction! Capacities up to 50 tons.

When you buy a jack—buy the best—buy a Blackhawk from your Industrial Supply House.

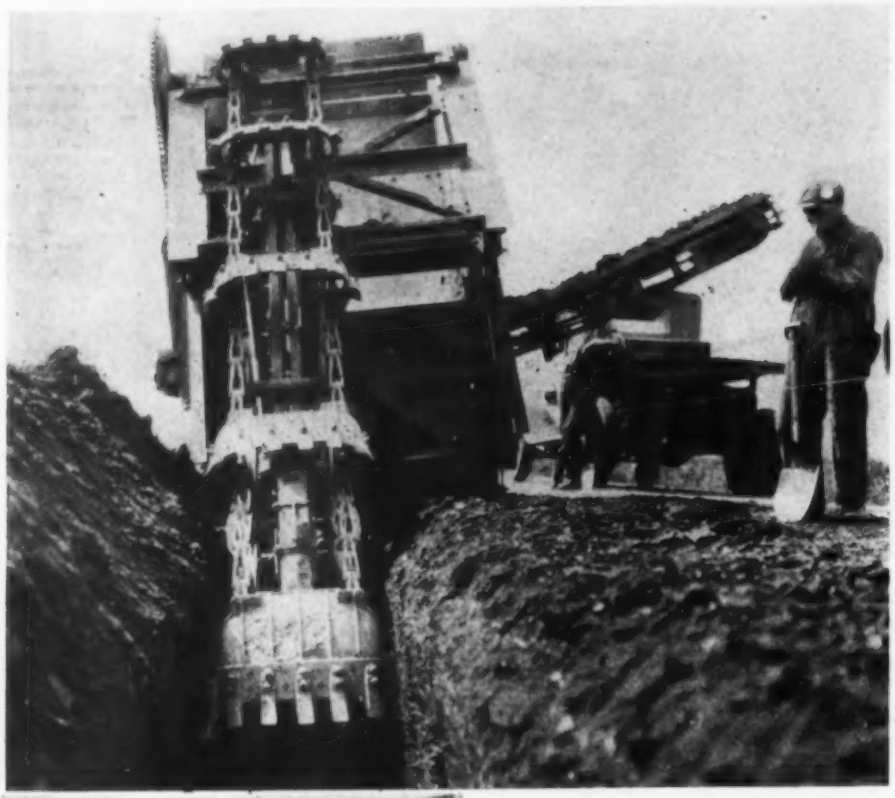
A Product of BLACKHAWK MFG. COMPANY, Dept. Milwaukee 1, Wisconsin

DEPENDABILITY SEAL OF *Service Proved* QUALITY PERFORMANCE

ARMY E NAVY

BLACKHAWK

PARSONS



OFFSET BOOM TRENCHING SAVES TIME

● Avoid costly hand excavation on difficult trenching by using a Parsons Trencher.

The offset boom, standard on Parsons Trenchers, makes it easy to dig close to steep banks, near trees or poles and next to curbing. The trench may be cut on line with the outside edge of either crawler just as efficiently as with the boom in center position

It takes but a few minutes to shift the boom to any position across the width of chute. The shift is positive through its rack and pinion mechanism and the boom is held solidly with heavy bolts through boom and carriage frame.

This is only one of the superior Parsons features.

THE PARSONS COMPANY
NEWTON, IOWA

TRENCHING EQUIPMENT PARSONS

(Continued from page 142)

itself by drawing sets of 3 to 5 mole channels at a slightly greater depth than the ordinary mole channels or minors, so that the minor moles just cut through the roof of the mains.

Open Grid-Work

A much better method of providing mains is to lay an open grid-work of tile lines. The tiles are laid at about 33-in. depth, covered with a deep layer of bushes, clinker, wheat straw or some other long-lasting permeable material. The moles are drawn straight through this bed of permeable material. It is not possible to say exactly how long mole drains will function effectively; a great deal depends on the type of clay subsoil and conditions at the time of drawing them, but it can be assumed that their useful life is from 5 to 10 yr. The advantage of putting in a system of tile mains covered with permeable material is that the mole channels can be renewed without any need for a new system of mains. In fact, mole draining is being encouraged in Eng-

(Continued on page 146)

Save money with accurate construction estimates

You know how much in profits it would mean to you to have more accurate estimates with less discrepancy between estimated and actual costs—how much in business gained by closer bidding. Now, this book helps you achieve these results. It will pay out further in time saved, by helping you to get accurate estimates more quickly and easily.

H. E. PULVER'S

Construction Estimates and Costs

653 pp., 6 x 9, many diagrams and tables, $5.00
Takes up each step of construction work separately—from first investigation to final, detailed estimates—and provides simple, arithmetical methods of accurately estimating costs. Covers estimating with both tables and diagrams and includes specimen tables and diagrams. Both diagrams and tables show variations in quantities as well as in prices of material and labor. Worked-out estimates for typical jobs show application of methods.

EXAMINE IT 10 DAYS — MAIL COUPON

McGRAW-HILL BOOK CO., INC.
330 W. 42nd St., New York 18, N. Y.

Send me Pulver's Construction Estimates and Costs for 10 days' examination on approval. In 10 days I will send $5.00, plus few cents postage, or return book postpaid. (Postage paid on cash orders.)

Name .....
Address .....
City and State .....
Position .....
Company ..... C.M. 7-44
(Books sent on approval in U.S. and Canada only.)

YOUR LINK-BELT SPEEDER HAS GONE TO WAR—

ON FRONTS ALL OVER THE WORLD!

Link-Belt Speeder Zephyrcrane operating in plate shop area.

These steel gratings are used for tanker runways and catwalks.

Link-Belt Speeder loading material on tanker at outfitting docks.

LINK-BELT SPEEDERS ON

IN MARINSHIP CORP. YARDS AT SAUSALITO, CALIFORNI

HEAVY-DUTY WORK

Buy More Bonds and Hold Them Until Maturity!

1527

LINK-BELT SPEEDER

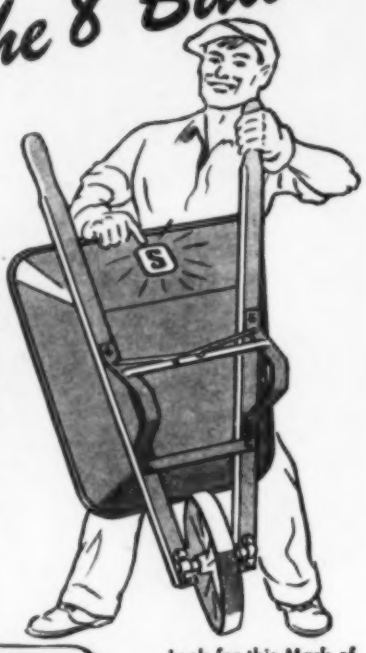
Builders of the Most Complete Line of

SHOVELS-CRANES-DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.

(A DIVISION OF LINK-BELT COMPANY)

Frankly, We're Behind the 8 Ball!



Due to material shortages, and other factors beyond our control, we are unable to keep up with the ever-increasing demand for Sterling Wheelbarrows. While this apparently puts us "behind the 8 ball", as far as deliveries are concerned, we are confident our good customer friends will understand our position.

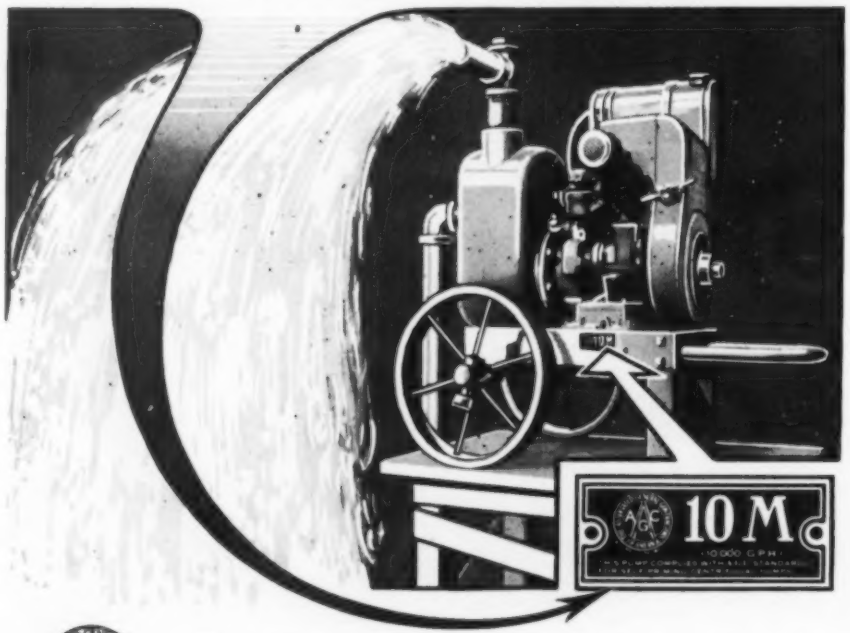
If you are urgently in need of wheelbarrows at this time, write us. We can make no definite delivery promises, but you can rest assured we'll do the best we possibly can to take care of your requirements.

STERLING WHEELBARROW CO., MILWAUKEE, WIS.

Look for this Mark of STERLING Quality

Sterling WHEELBARROWS

INSURED PERFORMANCE



When you buy a pump you want fast continuous pumping. Be sure the pump you buy carries the AGC rating plate. The plate is your insurance that the pump will deliver its full rated capacity.

CONTRACTORS PUMP BUREAU

BARNES MANUFACTURING CO. Mansfield, Ohio
C. H. & E. MANUFACTURING CO. Milwaukee, Wis.
CHAIN BELT COMPANY Milwaukee, Wis.
CONSTRUCTION MACHINERY CO. Waterloo, Iowa
THE GORMAN-RUPP CO. Mansfield, Ohio
JAEGER MACHINE CO. Columbus, Ohio
MARLOW PUMPS Ridgewood, N. J.
NOVO ENGINE CO. Lansing, Mich.
STERLING MACHINERY CORP. Kansas City, Mo.

Affiliated with
THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA, INC.

(Continued from page 144)

land as an act of cultivation to be practiced every few years.

Mole drainage is far from being a new practice. It has been in use for many years, the method of carrying out the drawing of the moles progressing with the changing methods of haulage. The up-to-date method of mole draining is to use a heavy crawler tractor. Popular sizes are the Caterpillar D7 and International TD18, both of which permit the use of a heavy mole drainer capable of good quality work.

Machine Trenching

The problem which has possibly received more attention than any other is the mechanical digging of trenches for tile drainage projects and for the main tile lines of mole drainage systems. Numerous attempts have been made to design plow-type trenchers and some of these have met with a reasonable degree of success, but the fact remains that they cannot be relied upon to give universal satisfaction with the varying soil types and conditions.

In order to expedite the work of providing good tile mains for mole drainage schemes, Britain's Ministry of Agriculture asked for and were supplied, under Lend-Lease, with 20 special type American Buckeye traction ditchers. These machines are mounted on rubber tires and travel quickly under their own power from site to site. This special need for mobility will be appreciated from the fact that an average mole drainage system covers about 20 acres and needs only, say, 30 chains of trench digging.

Wheel-Type Diggers

Two mechanically operated trenchers of special interest which have been developed are the Roteho and the Henderson. These machines are wheel-type diggers and both, for ease of production, are mounted on the back of Fordson tractors and are driven by the power take-off. The digging principle of the Roteho is a number of blade cutters mounted on the wheel which revolves at a sufficient speed to allow the blades to cut and carry the spoil above ground level where the blades pass through a cleaning jaw, and the spoil is pushed out to the side by a suitably shaped moldboard. The depth of digging is adjustable up to 3 ft.

A special reduction gear is fitted to the Fordson to reduce its forward speed to the digging speed of the trencher which is about 10 ft. per min. Experiments are

(Continued on page 148)

Three HELTZEL Bulletins For Post-War Concrete Construction Equipment

These bulletins contain all the latest information on concrete construction equipment, **including new war-time developments.**

Bulletin A-20 . . . Steel Forms for building concrete curbs, curb and gutters or sidewalks. A visual demonstration of the equipment required for all types of street improvements.

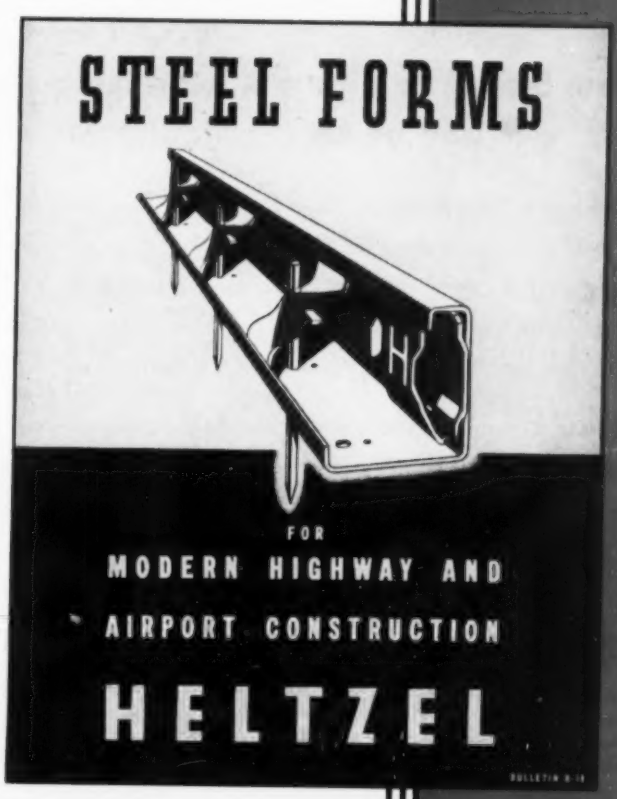
Bulletin B-19 . . . Steel Forms for Concrete Highway and Airport Construction. Shows the attachments available for constructing all types of curbs, etc., at the time the pavement is laid.

Bulletin C-34 . . . Portable Bins. Complete detail and data on batching plants from 52 to 100 tons capacity for either batch-truck or truck-mixer operations.

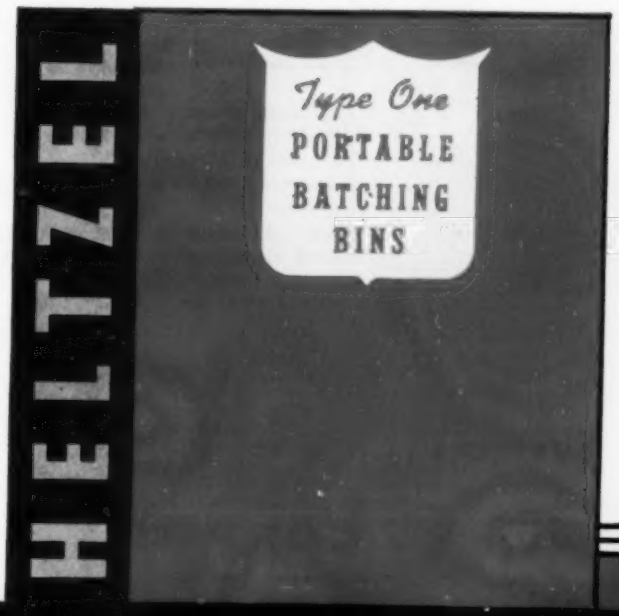
Catalogs and data are available for any size Central Mixing Plant . . . Truck Mixer Charging Plants . . . Portable or Stationary Bulk Cement Batching Plants or Tanks . . . Steel Storage Bins . . . Sub-grade Planers and Testers . . . Concrete Buckets . . . Joint Installing Machines and Materials.

Information that is vital to every post-war planner. Send for your copies today . . . there's no obligation.

Bulletin A-20
Street Improvements



Bulletin B-19
Highway & Airport Forms



Bulletin C-34
Batching Plants

HELTZEL Steel Form & Iron Co., Warren, Ohio

(*Continued from page* 146)

now being made to improve the depth adjustment so that instantaneous alteration to depth can be made. By this means it is hoped to dig accurately-graded trenches on uneven land. A special pipe-laying attachment, which plows small pipe depressions in the bottom of the trench and then lays the pipes, is now being produced.

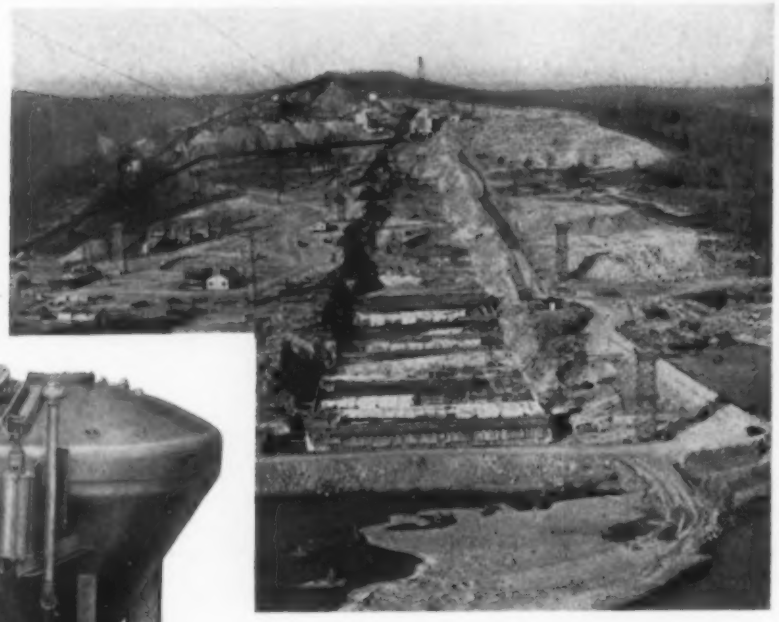
The digging wheel of the Henderson machine is in the form of a paddle wheel, each paddle acting as a spade which digs and lifts the spoil above ground level. The spoil is cleaned off the spades and pushed clear of the trench by two scrapers, the movements of which are synchronized with the digging action. Forward travel of the trencher is obtained by a slow motion winch coupled to the digging gear. The digging speed is about 6 ft. per min.

Another mechanically operated trencher is the Priestman Teredo. This machine is a special type of back acting-trencher suitable for use with the smaller sizes of excavators. The bucket is narrow and tapered to give a correctly shaped trench. Positive cleaning of the bucket is achieved by a special scraper.

A number of methods are used for re-

(*Continued on page* 150)

Air Borne is the Modern Method
It Gets the Job Done!



MOVE CEMENT
From Siding to Silo and/or Mixing Plant and Without Use of Mechanically Moving Parts

It's so simple, this Robinson Air-Activated System for handling bulk cement. Just the activator, as illustrated above, a supply of compressed air, the necessary piping and the receiving bin. Prominent contractors and ready mixed concrete plant operators have found in the Robinson System the answer to their problem of moving bulk cement from siding to the mixing plant or to storage.

Robinson Systems in the construction field are conveying bulk cement over distances ranging from a few feet up to 3500 feet, with rises up to 600 feet. Costs are low; maintenance practically nil, and wear on the system negligible. Write for illustrated bulletin.

• • •

Among the contracting jobs on which Robinson Air-Activated Conveyor Systems have been used for handling cement are:

Frederick Snare Corp. (Tygart River Dam, W. Va.)
Calaveras Cement Co., San Francisco
Tennessee Valley Authority, Pickwick Dam
Tennessee Valley Authority, Watts Bar Dam
Tennessee Valley Authority, Appalachia Dam
Tennessee Valley Authority, Fontana Dam
C. F. Lytle Co., Denison, Texas
Utah Construction Co. & Morrison Knudsen Co., Norfolk Dam, Ark.
Morrison Knudsen Co., Salina, Tenn.

ROBINSON *Air-Activated* Conveyor Systems
Division of MORSE BOULGER DESTRUCTOR CO.
211-C EAST 42nd STREET NEW YORK 17, N. Y.
Representatives in All Principal Cities

NATIONAL GUNITE
Pressure - Packed CONCRETE
has superior advantages:

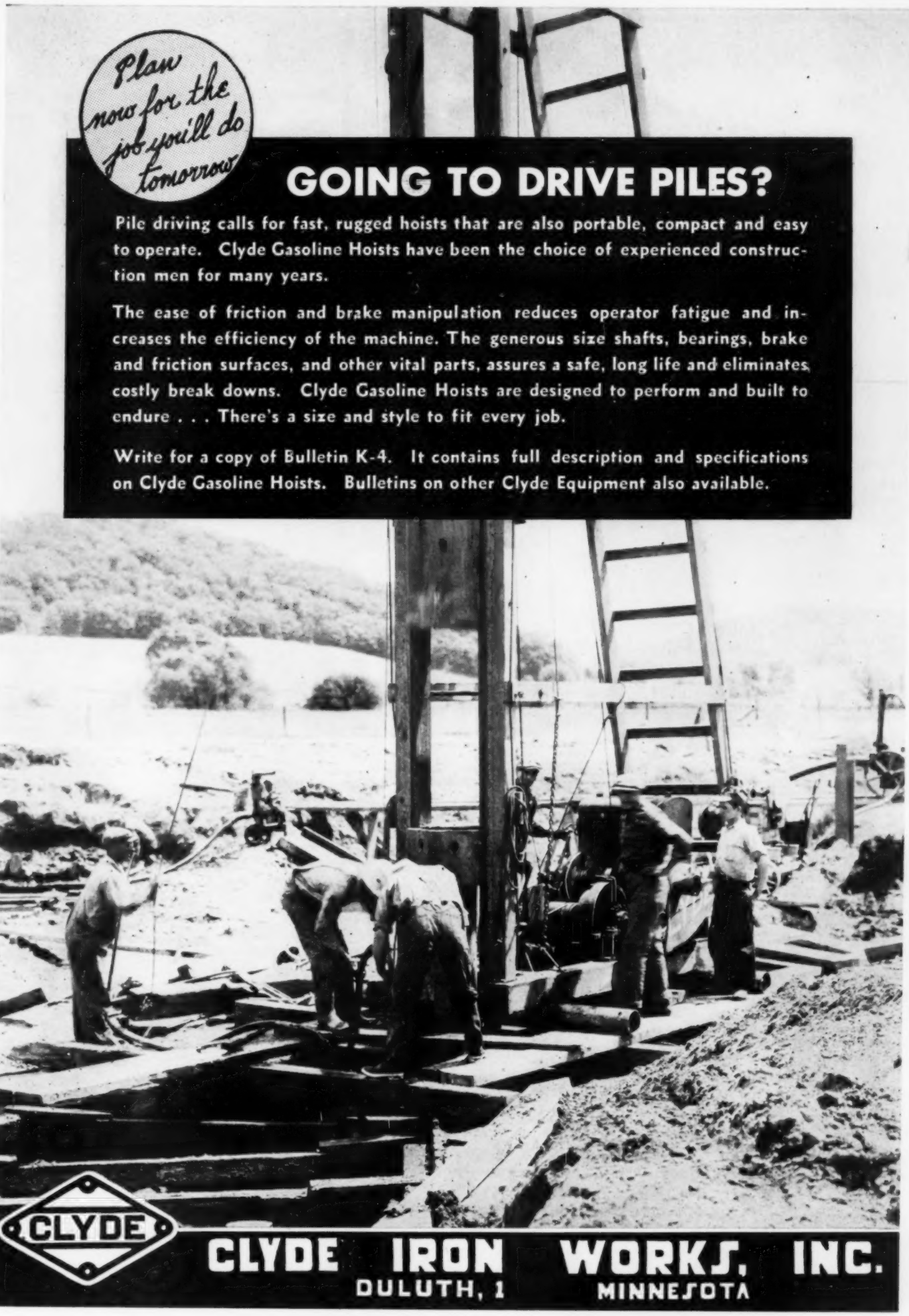
Low water ratio assures density at all points—no voids, no bubbles or air pockets. . . . Waterproof—perfect steel protection. . . . Greater strength with less thickness . . . No waste of material. . . . Great savings in time.

Recommended for rebuilding or relining disintegrated concrete and steel as well as new work.

National Gunite is a coast-to-coast engineering organization with years of experience, supplemented by field crews of skilled Gunite operators.

Write, giving your requirements

NATIONAL GUNITE CORPORATION
420 Lexington Ave., New York 17, N. Y.
Boston—Washington



Plan now for the job you'll do tomorrow

GOING TO DRIVE PILES?

Pile driving calls for fast, rugged hoists that are also portable, compact and easy to operate. Clyde Gasoline Hoists have been the choice of experienced construction men for many years.

The ease of friction and brake manipulation reduces operator fatigue and increases the efficiency of the machine. The generous size shafts, bearings, brake and friction surfaces, and other vital parts, assures a safe, long life and eliminates costly break downs. Clyde Gasoline Hoists are designed to perform and built to endure . . . There's a size and style to fit every job.

Write for a copy of Bulletin K-4. It contains full description and specifications on Clyde Gasoline Hoists. Bulletins on other Clyde Equipment also available.

CLYDE

CLYDE IRON WORKS, INC.
DULUTH, 1 MINNESOTA

For those tough pulling jobs — Simplex Jenny Center Hole Hydraulic Puller!

Five models; capacities 30 to 100-tons.

Completes in minutes—production, maintenance and repair jobs which otherwise require hours. Pulls, pushes or lifts and can readily be set up as a portable press. Center hole makes unit a great saver of manpower when pulling bushings, cylinder liners, pistons, wrist pins, valve seats, keys, wheels, sprockets, gears, boiler tubes, pipes, etc. Built of heat treated alloy steels. Ask for Bulletin No. 43J.

Templeton, Kenly & Co., Chicago (44), Ill.
Better, Safer Jacks Since 1899

Simplex
LEVER · SCREW · HYDRAULIC
Jacks

Write for bulletin on the proper care and lubrication of jacks.

LACLEDE **HIGHWAY STEELS**

WIRE MESH
Slab reinforcement keeps cracks closed and holds slab together.

DOWEL SPACERS
Assures correct alignment and simple installation of shear dowels.

CENTER JOINT
For controlling longitudinal cracking of pavement.

Specify Them!!

REPORTED HIGHWAY RESEARCH INDICATES STEEL REINFORCEMENT IS NECESSARY IN PAVEMENTS FOR LONG LIFE AND LOW MAINTENANCE.

LACLEDE STEEL COMPANY
ST. LOUIS, MISSOURI

(*Continued from page* 148)

filling tile drainage trenches, including small bulldozer and angledozer attachments fitted on to Fordson tractors.

These, then, are some of the machines which are helping in the restoration and improvement of the field drainage systems of agricultural land in Britain. Production of the machines has not always been easy, owing to the heavy demand for munitions; but the machines invented and produced during the war have done much to meet the needs of a country at war dependent in the last resort on home-grown food supplies. When the war ends, the value of the work will be just as clear, as it will help post-war agriculture too. The foundations are well-laid for peace-time farming.

★ ★ ★

Galveston Army Air Field

(*Continued from page* 64)

shoulders were sprayed with asphalt emulsion.

In advance of the paving crew, after steel forms have been set to line and grade, a patrol grader trimmed the subgrade to cross-section profile, and a tractor-scraper removed excess material windrowed by the blade. Finally, the subgrade was compacted by a pneumatic-tired roller.

Progress

A contract for an amount in excess of $2,000,000, involving 500,000 cu.yd. of earthmoving and related construction work, such as drainage, in addition to more than 1,000,000 sq.yd. of concrete and stabilized sand-shell paving, was awarded to the Austin Road Co. on March 10, 1943. Arrangements were made to allow the Army Air Forces to continue to use the field throughout the construction of the new facilities. Operating five paving mixers, the contractor and subcontractor succeeded in making the new runways and aprons available for use 30 days ahead of schedule.

In recognition of excellent construction performance in completing the airdrome, an Army-Navy E award was presented to the contractor and associated subcontractors on Aug. 12. Tyree L. Bell,

(*Continued on page* 154)

BLAME THAT CARBON ON A "LAZY" OIL!

. . . keep Diesels on the "GO" with hard-working TALPEX

UNDER TODAY'S OPERATING CONDITIONS a "lazy" oil piles up carbon faster than ever . . . causes excessive sludge in the crankcase, lacquer deposits on rings and pistons. A "lazy" oil simply doesn't have the properties to do a complete job of engine lubrication.

But many operators who have switched to new hard-working Talpex Oil find their engines running for longer periods of time between overhauls, and with greater operating efficiency. The reason is simple. A "lazy" oil is one that has only one, or perhaps two of the properties necessary to efficient engine operation. Shell Talpex has *all* of the necessary properties.

NEW SHELL TALPEX

Is Non-Corrosive to alloy bearings. Protects *all* lubricated engine parts against corrosion.

Has Exceptional Oxidation Stability. Holds to a minimum the formation of sludge, lacquer and other deterioration particles.

Has High Detergency. Helps keep carbon, lacquer and foreign particles from adhering to pistons and rings, valves, ports.

Has Low Carbon-Forming Tendency. Reduces ring sticking and wear. Lengthens engine life.

* * *

If the oil you now use does not have *all* these properties it's a "lazy" oil . . . should be changed to hard-working Shell Talpex. Ask the Shell man to show you why.

SHELL

TALPEX

THE NEW, ALL-PURPOSE, HEAVY-DUTY LUBRICANT

For trucks, busses, tractors, shovels, stationary and marine Diesels

KNOW YOUR BLAW-KNOX DISTRIBUTOR

ALABAMA
Birmingham — Standard Con. Supply Co.
ARIZONA
Phoenix — State Tractor Equipment Co.
ARKANSAS
Little Rock — Lyons Machinery Company
CALIFORNIA
Los Angeles — Le Roi-Rix Machinery Co.
E. M. Ornitz
San Francisco — C. H. Grant Company
COLORADO
Denver — Ray Corson Machinery Co.
CONNECTICUT
New Haven — W. I. Clark Co.
DELAWARE
Philadelphia, Pa. — Giles & Ransome
DISTRICT OF COLUMBIA
Washington — Matt A. Dostech Mach. Co
FLORIDA
Jacksonville — Florida Equipment Co.
Miami — Florida Equipment Company
Tampa — Epperson & Company
GEORGIA
Atlanta — W. C. Caye & Company
IDAHO
Boise — Intermountain Equip. Co.
ILLINOIS
Chicago — O. T. Christerson Co.
St. Louis, Mo. — O. B. Avery Company
INDIANA
Indianapolis — Reid-Holcomb Co.
Chicago, Ill. — O. T. Christerson Co.
Louisville, Ky. — Brandeis Machinery & Supply Co.
IOWA
Davenport — Clarke-Robinson Co.
Des Moines — Herman M. Brown Co.
KANSAS
Kansas City — G. W. Van Keppel Co.
KENTUCKY
Louisville — Brandeis Mach. & Supply Co.
LOUISIANA
New Orleans — Southern States Equip. Co.
MAINE
Portland — Stanley-Cadigan Company
MARYLAND
Baltimore — Henry H. Meyer Co., Inc.
MASSACHUSETTS
Boston — The Equipment Company
New Haven, Conn. — W. I. Clark Co.
MICHIGAN
Detroit — Wm. P. Favorite Company
Grand Rapids — Contractors Mach. Co.
Iron Mountain — Service & Supply Division of Lakeshore Engineering Co.
MINNESOTA
Duluth — Borchert-Ingersoll, Inc.
St. Paul — Borchert-Ingersoll, Inc.
MISSISSIPPI
Amory — Dalrymple Equip. Co.
New Orleans, La. — Southern States Equipment Co.
MISSOURI
Kansas City — G. W. Van Keppel Co.
St. Louis — O. B. Avery Company
MONTANA
Billings — Western Const. Equip Co.
NEBRASKA
Omaha — Anderson Equipment Co.
NEVADA
Los Angeles, Cal. — E. M. Ornitz
San Francisco, Cal. — C. H. Grant Co.
NEW HAMPSHIRE
Barre, Vt. — Casellini-Venable Corp.
Boston, Mass. — The Equipment Co.
Portland, Me. — Stanley-Cadigan Co.
NEW JERSEY
New York, N. Y. — R. E. Brooks Company
Philadelphia, Pa. — Giles & Ransome
NEW MEXICO
Albuquerque — Hardin & Coggins
NEW YORK
Albany — Larkin Equipment Co.
Buffalo — Trevor Corporation
Elmira — LeValley, McLeod & Kinkaid
Endicott — Newing Motors Co., Inc.
New York — R. E. Brooks Company
Rochester — Keystone Builders Supply
Syracuse — Syracuse Lumber Co.
Utica — McQuade & Bannigan, Inc.
NORTH CAROLINA
Raleigh — Carolina Tractor & Equip Co.
Salisbury — Carolina Tractor & Equip Co.
NORTH DAKOTA
Fargo — Dakota Tractor & Equipment Co.
OHIO
Cleveland — H. B. Fuller Equipment Co.
Columbus — W. W. Williams Co.
OKLAHOMA
Tulsa — Leland Equipment Co.
OREGON
Portland — Contractors Equipment Corp.
PENNSYLVANIA
Philadelphia — Giles & Ransome
Pittsburgh — Dravo-Doyle Company
RHODE ISLAND
Boston, Mass. — The Equipment Co.
SOUTH CAROLINA
Columbia — Jeff Hunt Road Machinery Co.
SOUTH DAKOTA
Rapid City — J. D. Evans Equip. Co.
TENNESSEE
Chattanooga — Nixon-Hesselle Co.
Knoxville — Wilson-Weesner-Wilkinson
Nashville — Wilson-Weesner-Wilkinson Co.
Memphis — Road Bldrs. Equip. Co.
TEXAS
Dallas — Conley-Lott-Nichols Mach. Co.
Houston — R. E. Everett & Co.
UTAH
Salt Lake City — Lund Machinery Co.
VERMONT
Barre — Casellini-Venable Corp.
VIRGINIA
Richmond — Rish Equip. Co.
Roanoke — Roanoke Tractor & Equip. Co.
WASHINGTON
Seattle — Star Machinery Co.
Spokane — Empire Equipment Company
WEST VIRGINIA
Charleston — Charleston Tractor & Equip. Corp.
Clarksburg — Rish Equip. Co.
WISCONSIN
Milwaukee — Hunter Tractor & Mach. Co.
WYOMING
Billings, Mont. — Western Construction Equipment Co.
Denver, Colo. — Ray Corson Mach. Co.
ALASKA
Seattle, Wash. — Northern Commercial Co.
CANADA
Halifax, N. S. — Coleman Mach. Co., Ltd.
Montreal — Watson Jack & Co., Ltd.
Toronto — W. L. Ballentine Co.
Vancouver, B. C. — B. C. Equip. Co., Ltd.
Winnipeg — Kane Tractor & Equip. Co.
Saskatoon — Richardson Road Mach. Co., Ltd.
NEW FOUNDLAND
St. Johns — Dominion Dist. Co.

. . . for High Speed

ON ROADS AND AIRPORTS
USE THE BLAW-KNOX

TRANSVERSE BLADE AUTOMATIC CONCRETE PAVING SPREADER

AND THE

BLAW-KNOX FINISHING MACHINE

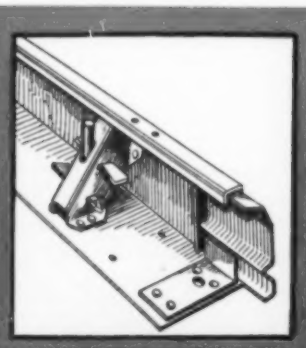
(EITHER MACHINE EQUIPPED WITH PAVING VIBRATOR IF DESIRED)

● Contractors prefer the Blaw-Knox Transverse Blade Spreader because of its enormous capacity for spreading concrete ahead of the finishing machine — its automatic spreading action regardless of where the concrete is placed on the subgrade — the absence of pressure on the side forms and avoidance of disturbing form alignment — freedom from job-interrupting breakdowns and excessive maintenance costs — does not segregate concrete regardless of maximum size of aggregate — narrow machines are convertible to wider machines and vice-versa.

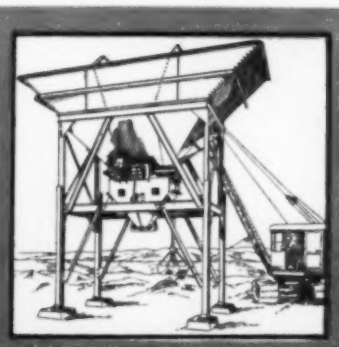
● Contractors also prefer the Blaw-Knox Finishing Machine because of the smooth finish obtained under maximum production conditions — wide screed ends prevent wastage of concrete over side forms — six traction speeds and four screed speeds for flexibility of operation to handle varying types of concrete — machine is easily and quickly adjustable for width — proper weight distribution makes machine easy on the side forms and easy to steer — low upkeep cost — easy to operate.

● The combination of the Blaw-Knox Finishing Machine and Transverse Blade Spreader has the capacity to handle the maximum output of two 34-E Dual Drum Pavers.

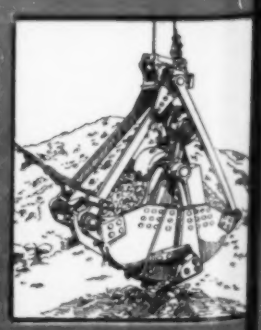
● See your nearest Blaw-Knox distributor about Blaw-Knox Finishing Machines and Blaw-Knox Transverse Blade Automatic Concrete Paving Spreaders for your next paving job.



PAVING FORMS FOR AIRPORTS AND ROADS

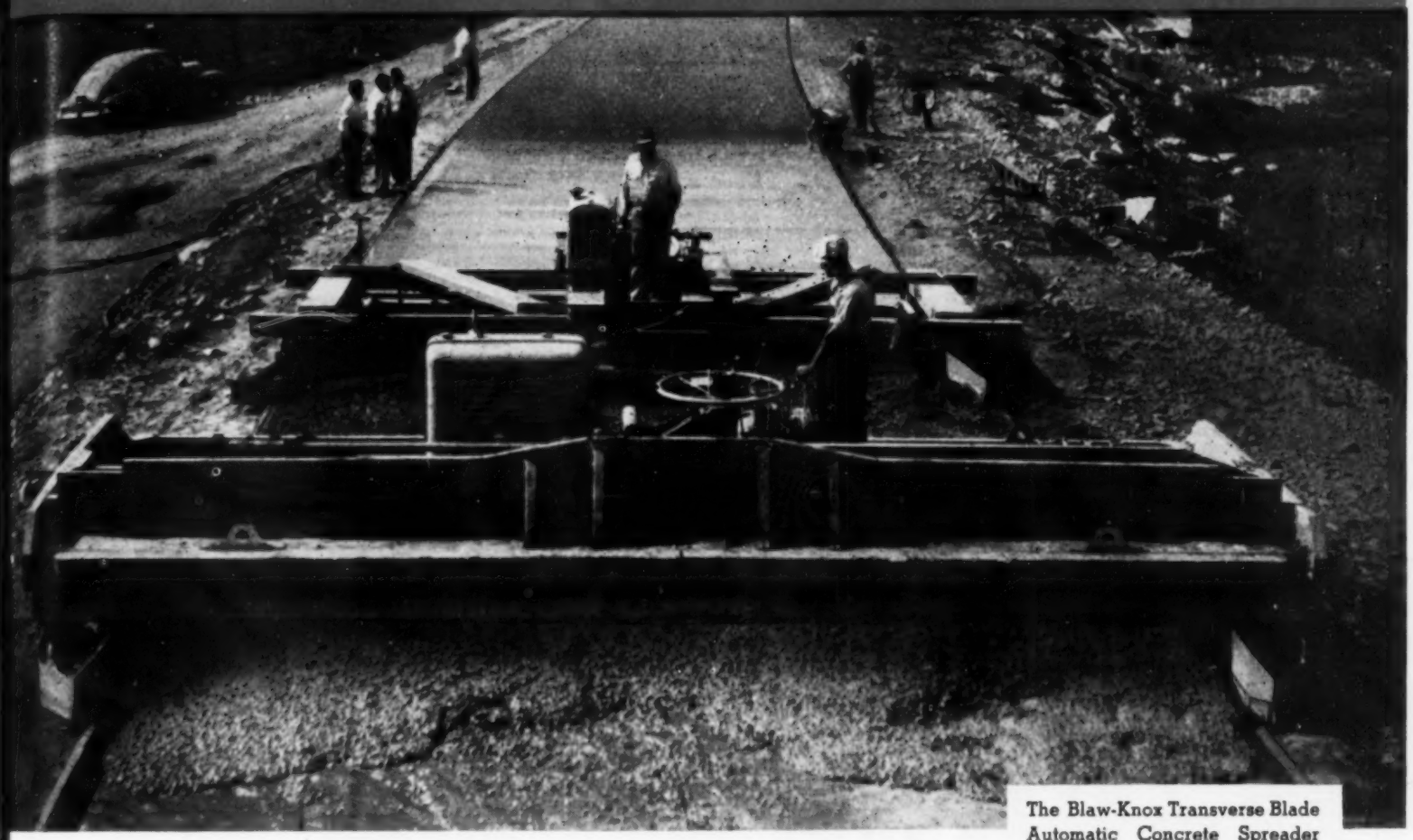


AGGREGATE BATCHING PLANTS



CLAMSHELL BUCKETS

Quality Paving Production



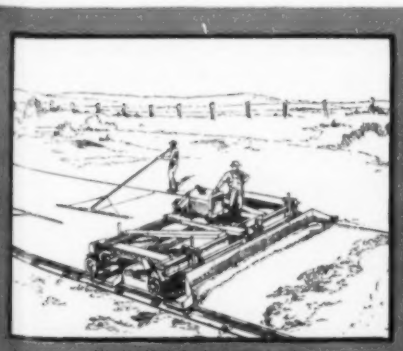
The Blaw-Knox Transverse Blade Automatic Concrete Spreader and the Blaw-Knox Finishing Machine illustrated are paving the Queens Highway — the main east and west route in Ontario, Canada. The old pavement had disintegrated under heavy war traffic. Both machines are adjustable from 20 to 25 ft. widths. Photo shows paving operations on super elevated curve, 22 ft. width of slab.

- Pick for your job the machines that have made good on the world's toughest proving grounds, paving air bases and roads for the armed forces on every front.

- New points in design and construction, war inspired, will be found in the Blaw-Knox construction equipment you'll be using for post-war construction.

BLAW-KNOX

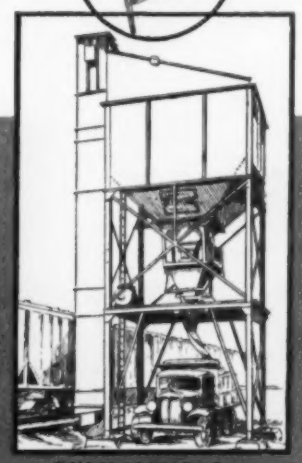
BLAW-KNOX DIVISION
OF BLAW-KNOX COMPANY
2086 Farmers Bank Bldg., Pittsburgh, Pa.
NEW YORK • CHICAGO • PHILADELPHIA
BIRMINGHAM • WASHINGTON
Representatives in Principal Cities



FINISHING MACHINES FOR AIRPORTS AND ROADS

SHEEPSFOOT TAMPING ROLLERS

CONCRETE BUCKETS



BULK CEMENT PLANTS

But before you tackle the big Post-War concrete contracting jobs, get acquainted with the wide scope in concrete surfacing operations offered by the JACKSON SC-4A vibratory hand screed. Its advantages include lightweight, uniform vibration and adaptability to reasonable widths of section. Gives complete puddling to low-water content concrete. Write for further details.

ELECTRIC TAMPER & EQUIPMENT CO.
LUDINGTON MICHIGAN

Reliance

Offers Post-War Service

Reliance Products

Rock Crushers, Bucket Elevators, Revolving Screens, Storage Bins, Pulverizers, Chip Spreaders, Heating Kettles, Bin Gates, Feeders, Belt Conveyors, Grizzlies, Air Separators, Sand and Gravel Spreaders, Wash Boxes.

How you are to be equipped for Post-War work, is a major concern to us right NOW. We offer you our facilities for your Post-War planning.

Advise us, then, if you will, what your requirements are likely to be in the period following the peace. For instance:

(1) What you are possibly going to need in Crushers, Screening and Conveying equipment, portable or permanent.

(2) Write us what improvements you would like to see made in equipment to meet your Post-War needs.

UNIVERSAL ROAD MACHINERY CO.
Kingston, N. Y., U. S. A.
DISTRIBUTORS IN ALL PRINCIPAL CITIES OF U.S.A.

(Continued from page 150)

vice president and general manager of the Austin Road Co., received the E pennant from Col. W. G. Saville, district engineer, U. S. Army. The presentation ceremony was informal by necessity as the contract had been completed so rapidly that the Austin Road Co. and its subcontractors already had transferred the majority of their employees from the job. The E award of the Harrison Engineering & Construction Corp. was presented to A. P. Little, who had supervised the paving work of this organization.

Direction

The paving contract described in these notes is one of several contracts on a $5,000,000 air field constructed for the Army Air Forces by the Corps of Engineers, Galveston District, of which Col. W. G. Saville is district engineer. At the site, M. R. Howard is area engineer in charge for the U. S. Engineers. R. W. (Rip) Dial, project manager, directed operations for the Austin Road Co., Dallas, Tex., contractor, and A. P. Little was in charge of paving work of the Harrison Engineering & Construction Co., subcontractor, Kansas City, Mo. Additional subcontractors who participated in other features of the Austin job were: Williams & Whittle and Williams & Broughton, Dallas, Tex.; W. A. Kelso Building Materials Co., Galveston, Tex.; John Young Trucking Co., Kilgore, Tex.; Roy White Electric Co., Houston, Tex.; and Armstrong and Davidson, Athens, Tex. All these firms were included in the E award.

★ ★ ★

Preventive Maintenance

(Continued from page 78)

rope is of the best construction and of a type which gives us long life. The last two years we have learned that a wire rope can be made to last two, three, and even four times the life expectancy we set back in pre-war years.

The time we spend in checking, cleaning, and oiling ropes not only costs us practically nothing, but we have found it pays us much better and bigger opera-

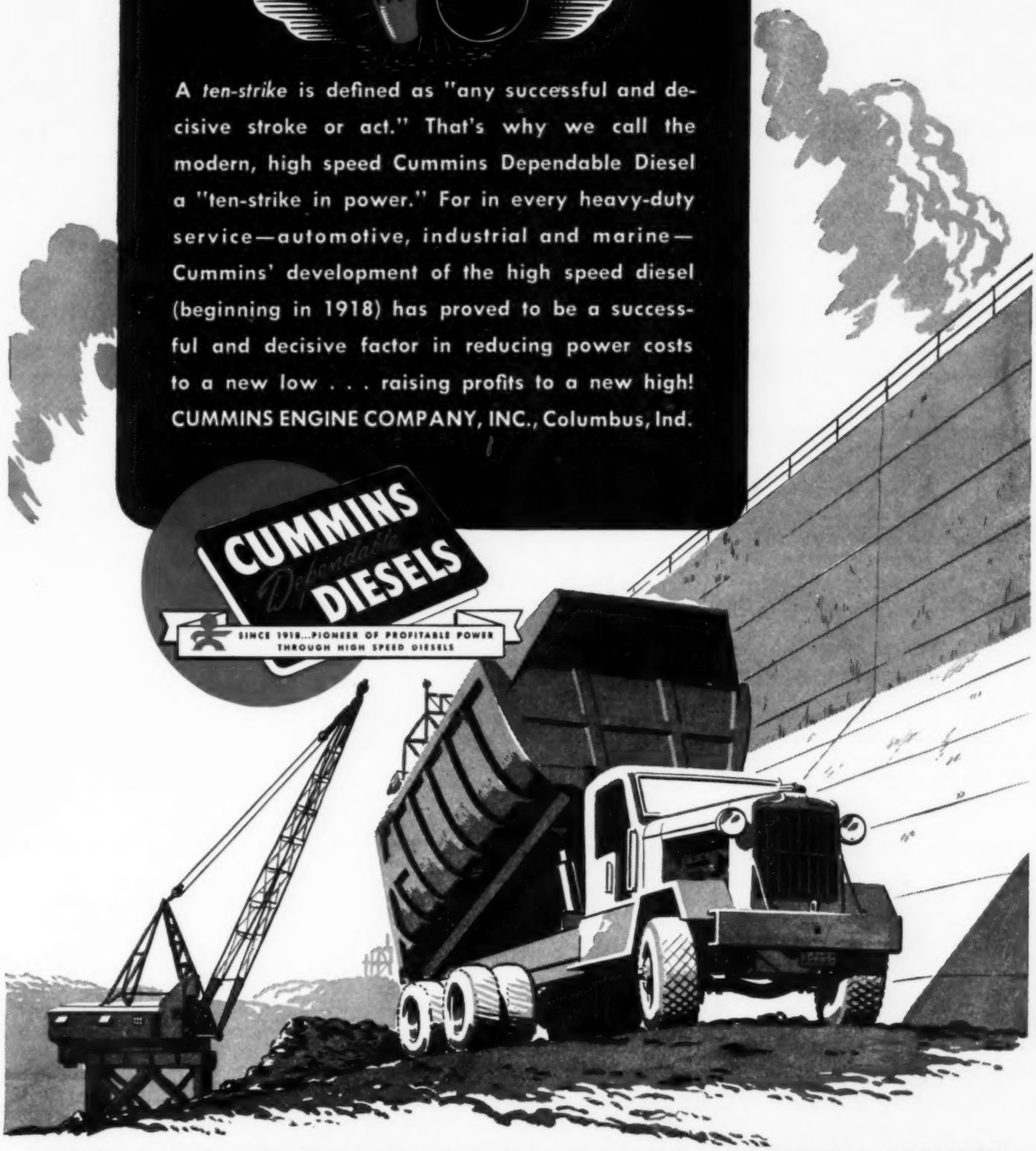
(Continued on page 156)

TEN-STRIKE IN POWER

A *ten-strike* is defined as "any successful and decisive stroke or act." That's why we call the modern, high speed Cummins Dependable Diesel a "ten-strike in power." For in every heavy-duty service—automotive, industrial and marine—Cummins' development of the high speed diesel (beginning in 1918) has proved to be a successful and decisive factor in reducing power costs to a new low . . . raising profits to a new high!
CUMMINS ENGINE COMPANY, INC., Columbus, Ind.

CUMMINS *Dependable* DIESELS

SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

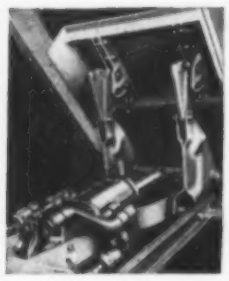


HEAVY-DUTY MODELS FOR AUTOMOTIVE AND INDUSTRIAL SERVICE

HERCULES

HYDRAULIC HOISTS and DUMP BODIES

GIVE DEPENDABLE SERVICE ON ALL KINDS OF JOBS



HERCULES HYDRAULIC BOOSTER HOIST

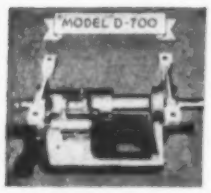
Makes any truck a Dump Truck

Install HERCULES DOUBLE-ARM HYDRAULIC HOISTS under your platform, stake, express or special bodies, which are now idle. Unload the easy way!

This is the Model KXE Hoist, with 6" cylinder, for bodies up to 12 feet long. Body reinforcing plate and steel sills included. Control valve is operated from driver's seat.

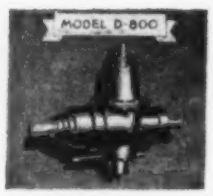
USE THE HERCULES SPLIT-SHAFT POWER TAKE-OFF

To operate any truck-mounted equipment



Direct (D-700 Series), Side (D-800 Series) and Dual Drive (B) models are available for operation of almost every possible type of truck-mounted equipment, either singly or in combination.

Recommendations and complete specifications upon request.



HERCULES STEEL PRODUCTS CO.

GALION, OHIO

WELLMAN Williams Type BUCKETS

Welded Rolled Steel

FOR GREATER STRENGTH AND LONGER SERVICE

Wellman Buckets combine all the mechanical advantages of the famous Williams Bucket with the welded construction features formerly found in Wellman custom-built heavy duty steel mill buckets.

Send for Free Bulletin

Tell us about your particular requirement and we will send full description of construction and features in special bulletins which clearly prove why YOUR NEXT BUCKET SHOULD BE A WELLMAN-WILLIAMS.

Multiple Rope and Power Arm Type Dragline • Power Wheel • Dredging. Special Service Buckets ⅜ to 16½ Yd. Capacities.

THE WELLMAN ENGINEERING COMPANY

7017 Central Avenue Cleveland 4, Ohio

SALES AND SERVICE AGENCIES IN PRINCIPAL CITIES

(Continued from page 154)

tional dividends. It has been our experience that it takes not more than one-tenth of one percent of an operator's time to service his cables properly. This is scarcely a sufficient amount of time to consider as an expense factor. The cost of grease, as all operators know, is insignificant.

Rope Service

Every foot of rope we use is preformed. We first changed to preformed for high speed work where ropes, by necessity, were given a great deal of punishment. As time went on our experience encouraged us to standardize on preformed as we found that we got double the life from it without the stress of care. And when we apply what we have learned these last 2 yr. about rope service and care, we add another life to our cables.

Photos Help Train Workmen

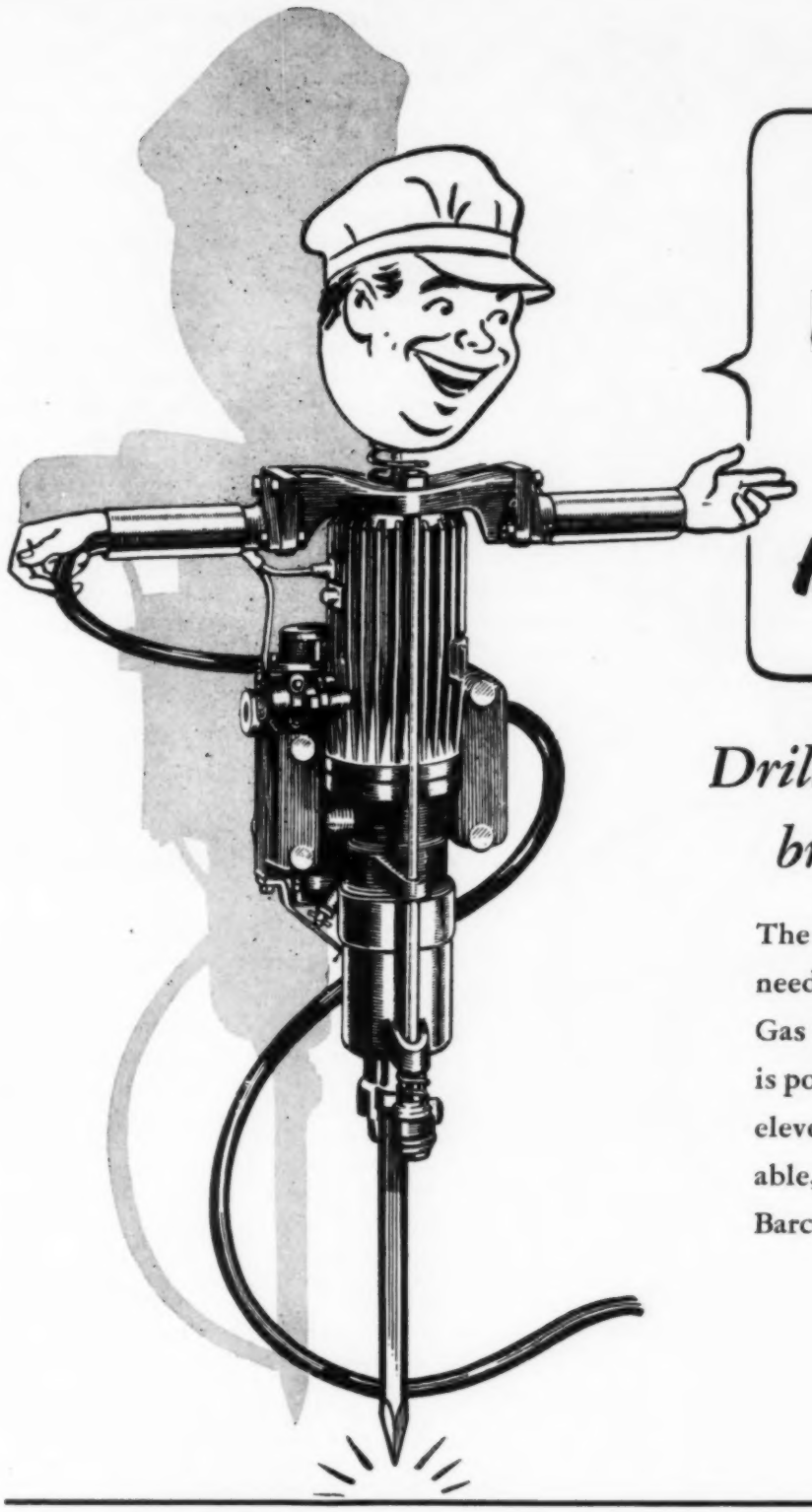
In emphasizing the absolute necessity of preventive maintenance to one hundred or more trained machine operators and other general workmen in our organization, we have found that printed reminders, instructions, bulletins, and letters, get nowhere near the results that can be obtained from the use of pictures. The average individual is more impressed by one good picture than ten thousand printed words.

We keep in our files 8x10-in. prints, covering correct socketing, splicing, right and wrong spooling on the drum, slings, ropes damaged by bad sheave alignment —in fact, about every instance of rope use and misuse about the job. Some of these pictures we had taken by commercial photographers. Some of them our own men took and we had enlargements made from their films. The cost in either case is small as against the instruction value.

Pictorial Illustration

A good part of our success from longer machinery life I attribute to the interest in maintenance and care we have developed through pictorial illustrations. I have been thinking for a long time that it would be worthwhile if some manufacturer would develop a chart in picture form, carrying an operator through each stage from unloading, to and through ac-

(Continued on page 158)



"I MAKE LIGHT WORK OF HEAVY JOBS"

Drilling, digging, driving, breaking or tamping

The tougher the job the greater your need for a low-cost Barco Portable Gas Hammer. A self-contained unit, it is portable under any conditions. With eleven special tool attachments available, you can meet any job on the spot. Barco Manufacturing Company, Not Inc.

BARCO

PORTABLE GASOLINE HAMMERS

BARCO MANUFACTURING CO., NOT INC.
1812 Winnemac Ave., Chicago 40, Ill.

Gentlemen:

Without obligation on my part please send me a copy of the BARCO HAMMER BOOKLET.

Name_____

Street_____

City_____ State_____

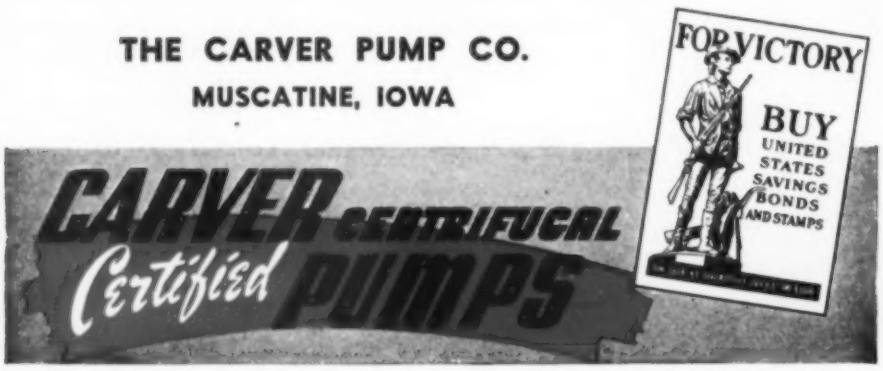
• The Carver "Certified" Tag means that the pump carrying it will stand up under tough assignments. It means that your Carver has been proved satisfactory both in the laboratory and on the job. It guarantees that the pump will go to work at once and keep on working at high efficiency.

Look for a Carver when you want rugged performance on road jobs. Write today for catalog, prices, deliveries, and name of dealer in your territory. No obligation, of course.

...the Road Contractor's Pump

THE CARVER PUMP CO.

MUSCATINE, IOWA



(Continued from page 156)

tual operation. These clear, candid-camera pictures might well show the operator what *not* to do as well as exactly what to do. Here would be something, if got up in folder form, which would mean a great deal to both equipment owners and operators.

Of course, no method of preventive maintenance is a cure-all. But a constructive program along this line is a "must" if we are to remain in business until stocks of steel are again available in ample quantities. It seems to me, here is a pre-post-war plan that we, as contractors, should be working on now. In truth, if we don't work on it, and hard, we won't continue being contractors long. Longer life, and then longer life again, for existing equipment requires constant pounding on the part of management, but I think it is our job and we better START AT HOME in our own organization.

★ ★ ★

Sector Floodgates

(Continued from page 68)

around the top and bottom of the lower hinge to absorb the effects of electrolysis in salt water and prevent eating away of the steel. The upper hinge is held in position by anchor bolts to a steel frame buried in a heavy block of concrete.

Thick rubber gaskets around three edges of the skin plate make a watertight seal with the lock wall, sill and adjoining gate when the gates are in closed position. About 3,000 lb. of rubber was required for the four sector gates in the two floodgate structures. The bottom gasket is in contact with a ¼-in. Monel plate attached to the sill. Original design requirements of 8,000 lb. of Monel metal were reduced to 725 lb. to conserve this critical material.

Poiree Dams—For emergency use in cofferdamming and unwatering the sector gate installation, the contract called for portable Poiree dams sufficient to close off one floodgate structure at a time. Sills and studs to anchor the Poiree dams were provided in the floor of each floodgate structure. An accompanying photograph indicates the A-frame towers which support the steel bulkhead sections used in the dams. Twelve steel-frame supports and 22 bulkheads make up the complete assembly for the two Poiree dams.

Floodgate Substructure—Soil at the site of the two floodgates is a fairly tight

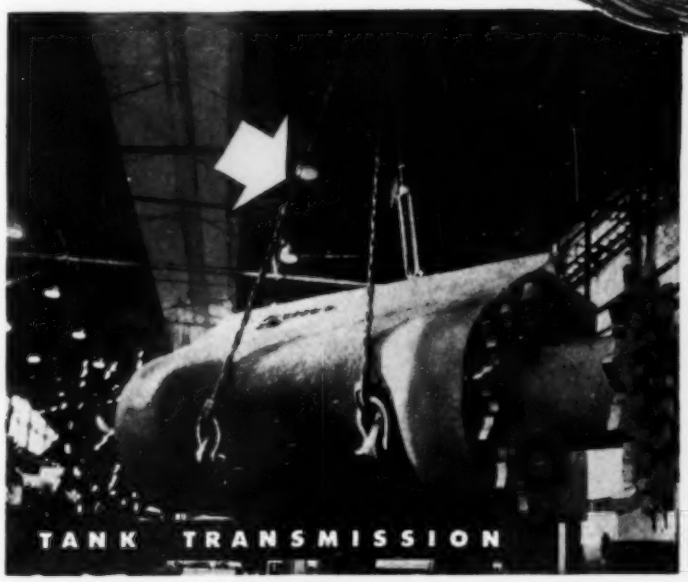
(Continued on page 162)

When virtually every load is tagged for war production, efficient handling becomes an obligation—one you'll discharge on all counts with Yellow Strand Braided Wire Rope Slings.* *Safety?* The strength of this patented sling lies in tough Yellow Strand Wire Rope, so braided that it gains marked flexibility . . . conforms readily to any product . . . grips it gently but securely. *Speed?* Light weight and high kink-resistance make the sling easy to carry, attach and remove. *Economy?* A compact braided sling conserves manpower and materials, compared with bulky types. Even when lifting heavy locomotives, turbines, pressure towers or weapons, a Yellow Strand Braided Sling will require fewer men —and less steel. And for such lighter lifts as jigs, tools, drums or crates, a Yellow Strand Sling offers relief from the fiber shortage. Fitting material-handling equipment to your specific job is the function of Broderick & Bascom's specialized Sling Engineers. Investigate today!

Broderick & Bascom Rope Co., St. Louis

Branches: New York, Chicago, Houston, Portland, Seattle
Factories: St. Louis, Seattle, Peoria

FREE
Riggers' Hand Book
96-pages of practical wire rope sling information. Send for free copy.



*Patents: U. S., 1475859, 1524671, 2142641, 2142642, 2299568 • Canadian, 252874, 258068

BRODERICK & BASCOM

YELLOW STRAND
Braided Wire Rope SAFETY SLINGS

Then he said to himself

"THEY CAN NEVER BOMB THIS PLACE"

WITH 300 pound vehemence, Reich-Marshal Hermann Goering once impressed the heilers and the heiled in Berlin with this guarantee:

"THEY CAN NEVER BOMB THIS PLACE"

He was not trying to mislead.

Give him credit . . . he had figured it out as any business man would:

(a) He figured what his competition had

(b) He figured what he had

The answer was simple arithmetic . . . then, departing from arithmetic

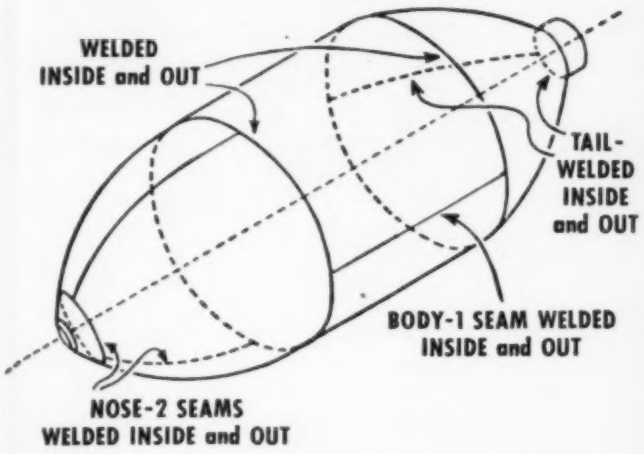
(c) He *estimated* how long it would take his competition to catch up. On *that* he went completely crackpot—unalterably haywire—irretrievably "losing his market" as they say.

And that just proves again that NO ONE can estimate the regular step-ups in output made possible by enthused producers

. . . having recourse to a flexible production technique

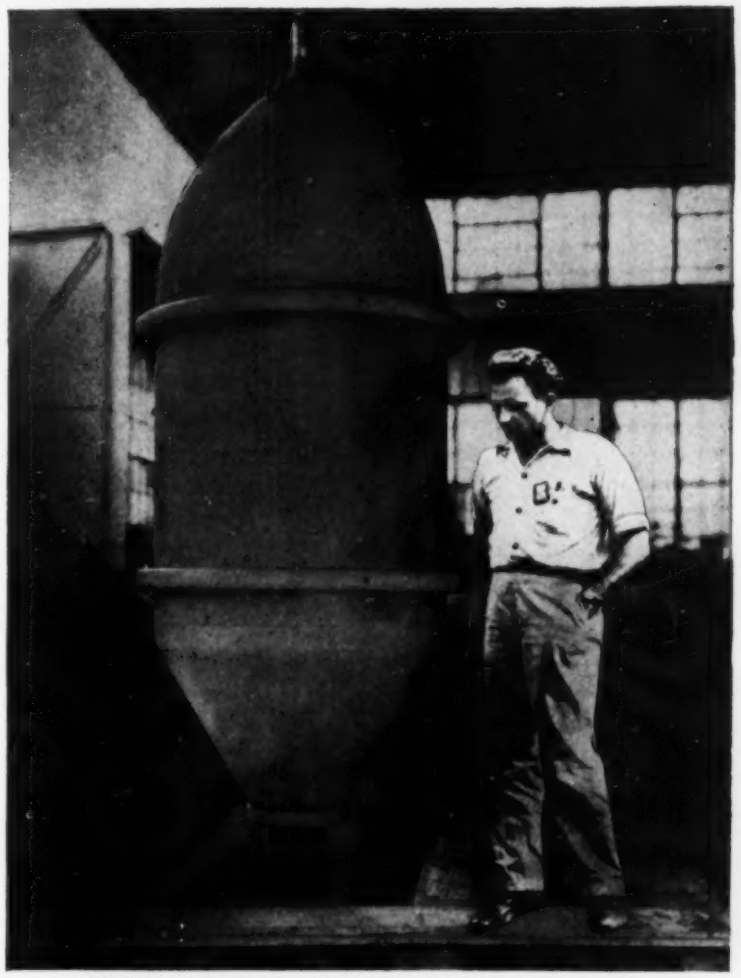
. . . that keeps improving regularly.

Listen Hermann, Never say NEVER!



You're too cagey a rascal *not* to have figured that *recourse* to Arc Welding would speed America's war output. So you estimated that step up at, say, 25%.

But as it turned out, production of Berlin-busters, ships, planes, tanks and guns was stepped up another 25% and then other 25%'s by added recourses applied **AFTER** your "NO BOMBING" assurance.



4000-lb. blockbuster, welded as shown in sketch. Its production has been increased by improved arc welding technique.

And now, the knockout blow

. . . Lincoln introduces the New "*Fleet-Welding*" Technique

recourse to which gives additional step-ups in welding production of 25% . . . 50% . . . 100% . . . and more.

This arc welding technique, developed by Lincoln Engineers, uses *arc force* to get deeper penetration and higher welding speed for all types of joints in mild steel plate, shapes and sheet. Procedure manual with full details will be sent free to engineers and production supervisors.

There is a Lincoln Engineer near-by to assist you in applying the "Fleet-welding" Technique to war production and postwar planning. Call him or write:

THE LINCOLN ELECTRIC COMPANY • Cleveland 1, Ohio

America's greatest natural **recourse**

ARC WELDING

(Continued from page 158)

silty clay through which groundwater travels slowly. The excavation was kept dry during construction by pumping from sumps. Under each floodgate structure is a cutoff wall of steel sheetpiles 30 ft. long, extending 1½ ft. into the concrete, to stop groundwater flow resulting from unbalanced heads on the two sides of the gate. Shorter sheetpiles 20 ft. long are installed in cutoffs under wing walls extending back into the banks.

Walls, gate hinges, Poiree sills and sill beams for the sector gates rest on untreated timber piles. Reinforced-concrete Poiree sills are 6 ft. thick, and the sill beams are 5 ft. deep.

Construction Quantities

Total structural steel for the two floodgate structures amounted to 400 tons, exclusive of the Poiree dams. Earthmoving operations involved 200,000 yd. of excavation and 100,000 yd. of fill. The contractor placed 17,000 cu.yd. of concrete, reinforced with about 200,000 lb. of steel bars. Cutoff walls required

(Continued on page 164)

DUFF-NORTON Jacks

No matter what the job may be, Duff-Norton Jacks can help you with the heavy lifting and moving. These powerful, easy-to-operate Jacks provide the "mechanical muscles" that help speed the work on every construction job. Make full use of these husky helpers!

NEW STREAMLINED CATALOG

Just off the presses, the new streamlined Duff-Norton Catalog 202 gives you complete data on every Duff-Norton Jack. Write for your free copy today!

THE DUFF-NORTON MANUFACTURING COMPANY
PITTSBURGH, PENNSYLVANIA
Canadian Plant: Coaticook, Quebec · District Representatives in Principal Cities

When the Axis Surrenders

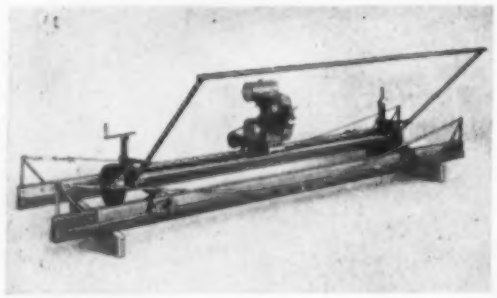
You'll find new and improved BYERS Draglines and Shovels available to go on your job.

In the meantime, owners of current and older models of Byers shovels and cranes may depend on Byers Parts Service to help them keep present equipment working steadily and satisfactorily.

BYERS CRANES AND SHOVELS
RAVENNA, OHIO
DISTRIBUTORS THROUGHOUT THE WORLD

FROM GW FACTORIES
DETROIT
WINDSOR, CANADA
MINNEAPOLIS
DETROIT
MARYSVILLE, MICH.
DETROIT
DETROIT
HIGHLAND PARK, MICH.
DETROIT
TROOP & CARGO BODIES
DUMP BODIES
WRECKER CRANES & WINCHES
SCRAPERS
REFUELING TANKS
BULLDOZERS
PATROL BOATS
TO FIGHTING FRONTS
Thousands of Gar Wood Units have been shipped to Concentration Depots and are a part of a tremendous assembly of truck and tractor equipment, supplies, ammunition, tanks, planes, boats and mighty field pieces, poised for instant use on all Fighting Fronts.
GAR WOOD INDUSTRIES, INC.
DETROIT 11, MICHIGAN

SCREEDING? One Man Handles 4 cu. yards of low slump concrete in 5 minutes with the *Whiteman* Rodding Machine



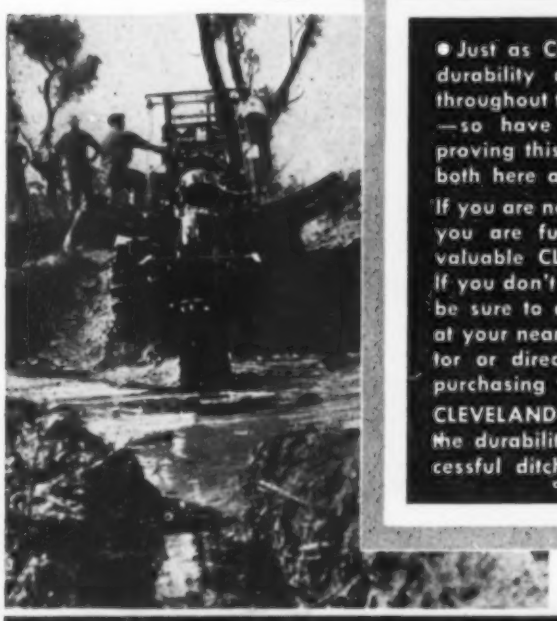
Now comes equipped with longer frame, a new type of crank and Pittman arm drive, shorter stroke, for smoother operation, and adjustable screed stick truss for maintaining perfect level on concrete slab work.

The transverse action of the two screed sticks vibrates, thoroughly compacts and puddles the slab, permitting the use of very low slump concrete. The resulting finish is level, well puddled and compacted, ready for floating or, if desired, final smooth finish with the Whiteman Dual Purpose Finishing Machine.

Write or wire today for performance data and name of your nearest distributor

Whiteman MANUFACTURING CO.
3249 Casitas Avenue — Los Angeles 26, California

Proved Again...
"CLEVELANDS" DURABILITY



● Just as CLEVELANDS proved their durability on tough ditching jobs throughout the nation before the war —so have they been consistently proving this durability on war jobs, both here and abroad.

If you are now a CLEVELAND owner, you are fully appreciative of this valuable CLEVELAND characteristic. If you don't now own a CLEVELAND be sure to apply for full particulars at your nearest CLEVELAND distributor or direct to the factory before purchasing your next ditcher.

CLEVELANDS will always give you the durability so necessary for successful ditching jobs.

THE CLEVELAND TRENCHER COMPANY
20100 ST. CLAIR AVE. "Pioneer of the Small Trencher" CLEVELAND 17, OHIO
"CLEVELANDS" Save More...Because they Do More

(*Continued from page 162*)

about 56,000 sq.ft. of steel sheetpiles, and the structures are supported by some 700,000 lin.ft. of untreated timber piling.

Creosoted timber guide structures flank the two approaches to each floodgate. These guide fenders required about 26,000 lin.ft. of creosoted piles and 167,000 b.ft. of creosoted timber, mostly in 6x12-in. and 8x8-in. sizes.

Versatile Crawler Cranes

Accompanying photographs show how the four crawler machines were converted to various uses to serve continuously during all phases of construction. At the start, they were equipped as draglines to excavate the two sites. Three of the rigs, two Northwests and a Bucyrus-Erie, operated 2½-yd. dragline buckets on booms about 60 ft. long. The fourth machine, a P&H of smaller capacity, swung a ¾-yd. bucket. With these excavators the contractor used an average of nine crawler wagons and four bulldozers, powered by Allis-Chalmers diesel tractors and a few Caterpillars.

Timber piles and sheet piles were driven by the larger cranes, operating drop hammers in swinging leads. The cranes also handled fender timbers, wall armor, concrete forms, concrete buckets and structural steel.

Concrete for the two gate structures was mixed by a Rex 27E paver and a Koehring 28S mixer. Trucks delivered batches of dry materials to the mixers from a batching plant in the nearest town, about 7 mi. distant, where an Industrial crawler crane charged the bins out of railroad cars. Concreting proceeded at a rate of about 25 cu.yd. per hr. in one gate structure at a time.

Field fabrication of the four sector gates required the driving of about 20,000 rivets. Welding of the joints between sections of skin plate took 3,000 lb. of welding rod. Including the rod used for equipment maintenance and other purposes, the total consumption of electrode on the job was about 10,000 lb.

To provide access to the two floodgate structures, the contract called for construction of 9 mi. of road estimated to require 60,000 yd. of fill and 16,000 yd. of oyster shell for surfacing. The contractor imported and used 32,500 yd. of shell.

Direction

For the U. S. Engineers, the floodgate structures have been built under the general direction of Col. W. G. Saville, district engineer, Galveston district, with George W. Avery as project engineer. Operations are directed for the Tellepsen Construction Co., Houston, Tex., contractor, by Ford E. (Jack) Cale, superintendent, with Harold E. Wibye as assistant superintendent.

Which of these Wire Ropes Would You Use?

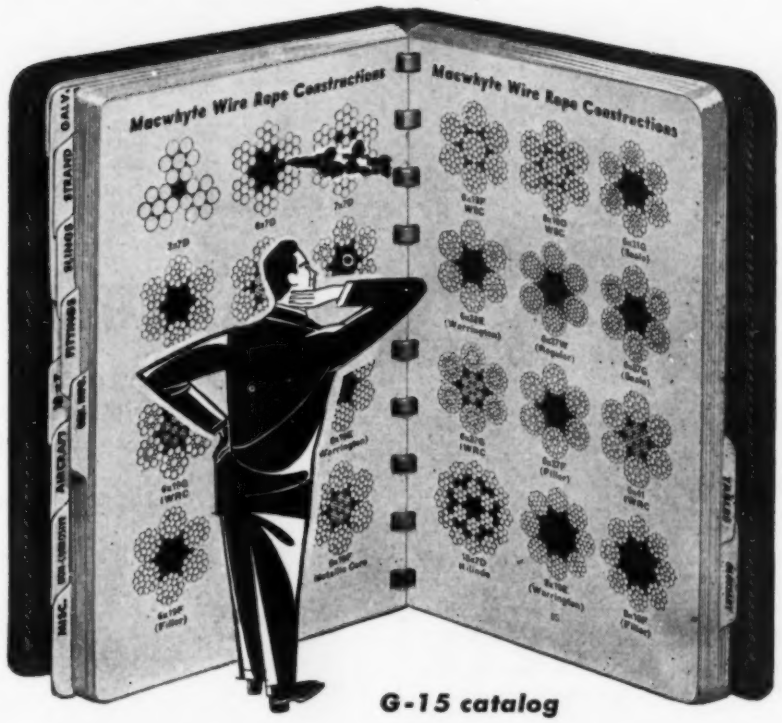
Years ago wire rope was not the highly specialized product it is today, nor was there as much use for wire rope or so many *different* uses.

Because of the many kinds of equipment using wire rope, plus the many and varied applications of that equipment, many sizes, grades, and constructions of wire rope must be made.

This makes it difficult for wire rope users to select the correct rope.

If the equipment is used in the normal way under average conditions, the manufacturer of the equipment can and does offer suggestions as to the type of rope they believe is best.

But should the equipment be altered to suit special needs, or should conditions not be average, a different wire rope specification is usually necessary for the best service.



G-15 catalog

Many Factors Considered

In recommending the correct wire rope for your equipment, several factors need to be considered:

1. Safety Factor—This has to do with the amount of loading and whether it is steady or a shock load.

2. Bending Fatigue—This has to do with the number and size of sheaves, size of drum, and also speed of rope.

3. Abrasion.

4. Type of Equipment.

5. Use of Equipment.

Conditions of service on a given type of equipment vary so much that it is often helpful to know the type of rope previously used and the service it gave.

Then after a study of this information, wire rope can be recommended that experience proves will give the best service.

Sounds difficult, doesn't it? Really it isn't difficult when you have the advice and counsel of Macwhyte Wire Rope Engineers. Just write to Macwhyte Company, its distributors or mill depots. Tell them the make and model number of your equipment, explain briefly what it is being used for, and mention the size, grade, and construction of the rope you are now using.

Remember — Macwhyte makes the "Correct Wire Rope For Your Equipment."

Pictured above are but a few of the types of wire rope made by Macwhyte so that you may have the "Correct Rope For Your Equipment." There is a size, grade, and construction of Macwhyte Wire Rope that will give you low cost, safe service.

MACWHYTE PREformed WIRE ROPE Plus Internal Lubrication Selected Steels Tested-Proved

The correct rope for your equipment

NS. 707

MACWHYTE COMPANY

ARMY E NAVY

Wire Rope Manufacturers

2941 FOURTEENTH AVENUE KENOSHA, WISCONSIN

Mill Depots: New York • Pittsburgh • Chicago • Fort Worth • Portland • Seattle • San Francisco. Distributors throughout the U.S.A.

MACWHYTE PREformed and Internally Lubricated Wire Rope — MONARCH WHYTE STRAND Wire Rope — MACWHYTE Special Traction Elevator Rope — MACWHYTE Braided Wire Rope Slings — MACWHYTE Aircraft Cables and Tie-Rods — MACWHYTE Stainless Steel Wire Rope — MACWHYTE Monel Metal Wire Rope

WHERE TO BUY

'RAMSEY'
3-Speed . . . ALL-STEEL
HAND WINCH

2 Sizes

5-ton capacity — 135-lb. spools, 325' of ½" cable $85
3-ton cap'y — 75-lb. spools, 150' of ½" cable $60

POWER FOR HEAVY LOADS, SPEED FOR LIGHT LOADS. Gear Ratios: 25 : 1, 4 : 1, 1: 1.

Write for circular and name of nearest dealer. A few territories are open for live distributors.

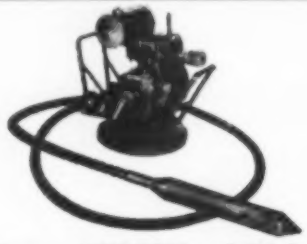
Manufactured by
RAMSEY MACHINERY CO.
1629 N. W. THURMAN ST., PORTLAND, ORE.

COMPLETE
WELL POINT SYSTEMS
WILL DRY UP ANY EXCAVATION
Faster—More Economically
Write For Job Estimate and 32 page Catalog
COMPLETE
MACHINERY & EQUIPMENT CO., Inc.
36-36 11th St., Long Island City, N. Y.
Tel. IRonsides 6-8600
Branch: Third Avenue & Adams St., Gary, Indiana
Telephone: Gary 23083

STERLING HOISTS

SIMPLE
DEPENDABLE
RUGGED
•
WRITE FOR LITERATURE

STERLING MACHINERY CORPORATION
405 Southwest Blvd., Kansas City, Mo.



Concrete VIBRATORS and Grinders
Write for Circular on types, sizes and prices
White Mfg. Co.
ELKHART INDIANA

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT : "OPPORTUNITIES" : EQUIPMENT
BUSINESS : : USED OR RESALE

RATES: 10c word, $2 minimum or $8.00 per inch per insertion

SELL YOUR SURPLUS EQUIPMENT

IT IS NEEDED TO SPEED THE WAR'S END

DSP INC. ORGANIZATIONS

We have a demand for your surplus and idle equipment—a single item or a complete plant. Send us your list of such equipment—and put it to work where it is needed most.

WE PURCHASE ON A CASH BASIS

DULIEN STEEL PRODUCTS, INC.

of Washington	*of California*	*of New York*
200 NATIONAL BLDG.	11611 SO. ALAMEDA	2280 WOOLWORTH BLDG.
SEATTLE 4, WASH.	LOS ANGELES 2, CALIF.	NEW YORK 7, N. Y.

FOR SALE

3-LOW HEAD PUMPS

FOR { CIRCULATING WATER / IRRIGATION / UNWATERING AND DRAINAGE

ALLIS CHALMERS—Vertical Centrifugal
Direct Connected Motor Driven Units

2—Pumps are—Type L.S. Size 42" x 36"—48,000 G.P.M.
31 Ft. Hd. 319 R.P.M.—500 H.P.—2200 Volts—3 Phase—60 Cycle

1—Pump is—Type L.S. Size 42" x 36", 35000 G.P.M.
31 Ft. Hd. 350 R.P.M. 2 Speed 2200 Volts—3 Phase—60 Cycle

IMMEDIATELY AVAILABLE DIRECT TO YOU

UNION ELECTRIC CO. OF MISSOURI
312 N. 12TH BLVD. ST. LOUIS, MISSOURI

WHERE TO BUY

GEORGE HAISS MFG. CO., INC.
139th ST & CANAL PL., NEW YORK ST., N.Y.
HAISS CLAMSHELL BUCKETS

FOR LEASE

Bulldozer Allis-Chalmers HD 7 Diesel Tractor.
Equipped with Baker Hydraulic Bulldozer.

UNDERWATER, INC.
535 Fifth Ave. New York 17, N. Y.
Murray-Hill 2-3616

POSITION WANTED

REPRESENTING CONSTRUCTION firm or manufacturer of construction equipment. Territory Detroit and Michigan Lifetime experience in industrial construction. Capable of selling, bidding, and supervision. Wide acquaintance in the construction field. Have established office location for eight years. PW 148, Construction Methods, 520 N. Michigan Ave., Chicago 11, Ill.

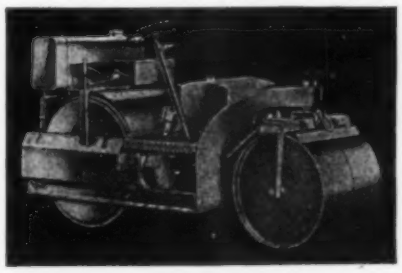
Advertiser's Index

(Continued from page 170)

National Gunite Corp. 148
Northwest Engineering Co. 21
Novo Engine Co. 120
Oakite Products, Inc. 106
Oliver Iron & Steel Corp. 49
Osgood Co., The 43
Owen Bucket Co., The 132
Page Engineering Co. 119
Parsons Co., The 144
Porter-Cable Machine Co. 112
Ramsey Machinery Co. 166
Ransome Machinery Co. 33
Raybestos Div., Raybestos-Manhattan, Inc. 168, 169
Riddell Corp., W. A. 126
Roebling's Sons Co., John A. 13
Rogers Bros. Corp. 100
Schramm, Inc. 35
Searchlight Section 166
Shell Oil Company 151
Shunk Mfg. Co. 128
Sinclair Refining Co. 96
Sisalkraft Co., The 130
Skilsaw, Inc. 29
Smith Co., The T. L. 137
Smith Engineering Works 139
Snap-on Tools Corp. 116
Socony-Vacuum Oil Co., Inc. 34
Sonoco Products Co. 108
Southwest Welding & Mfg. Co. 40
Standard Oil Co. (Indiana) 127
Sterling Machinery Corp. 166
Sterling Wheelbarrow Co. 146
Templeton, Kenly & Co. 150
Texas Company, The 15, 53
Thew Shovel Co., The 14
Timber Structures, Inc. 109
Timken-Detroit Axle Co., The 20
Timken Roller Bearing Co., The 91
Tyson Bearing Corp. 117
Underwater, Inc. 166
Union Electric Co. of Missouri 166
Union Metal Mfg. Co., The 12
United States Steel Corp., Subsidiaries 105
Universal Atlas Cement Co. 105
Universal Engineering Corp. 52
Universal Road Machinery Co. 154
Upson-Walton Co., The 51
Viber Company 104
Vulcan Iron Works 118
Wellman Co., S. K., The 39
Wellman Engineering Co., The 156
White Mfg. Co. 166
Whiteman Mfg. Co. 164
Wisconsin Motor Corp. 142
Wood Manufacturing Co. 135
Worthington Pump & Mach. Corp. 33, 170, 4th Cov

C.H.&E.

3 Ton Roller



For rolling footpaths, driveways, sidewalks, tennis courts, playgrounds, and general maintenance work. The forward and reverse speed is controlled by one hand lever. Both front and rear rolls can be filled with water. Easy to load on a truck for transportation from job to job.

We also manufacture Saw Rigs — Pumps — Hoists — Bar Cutters and benders.

Write for catalog.

C. H. & E. Manufacturing Co.
3847 No. Palmer St.
Milwaukee 12, Wis.

Up from the Sea ...*In "Ducks"*

A new and secret weapon until a few months ago, the GMC "Duck" has now become a valued veteran of invasion campaigns from Sicily to the South Pacific. Part boat and part truck, it combines the performance and advantages of both. Loaded with fighters, food or fighting equipment, it can travel from ship to shore, and back again, with a simple shifting of controls. On land, the "Duck's" powerful engine and sturdy, six-wheel drive chassis carry it over regular road or tough terrain, right along with the famous GMC 2½ ton, "six-by-six" Army truck. In the water, chassis and tires add stability and seaworthiness to the big, buoyant, all-steel hull, making for "smooth sailing" in heavy surf and high seas. Since our earliest wars, America's fighters have gone *Down To The Sea In Ships.* This is the first time they have come *Up From The Sea In Amphibian Trucks!*

INVEST IN VICTORY... BUY MORE WAR BONDS

GMC TRUCK & COACH DIVISION
GENERAL MOTORS

Home of Commercial GMC Trucks and GM Coaches . . .
Volume Producer of GMC Army Trucks and Amphibian "Ducks"

Boeing Flying Fortress equipped
with Raybestos "1492" Brake Blocks

NOTF

Raybestos "1492" Bomber Brake Block
and one of the Hayes Brake Assemblies

Raybestos

AMERICA'S BIGGEST SELLING BRAKE LINING

BRAKE LININGS CLUTCH FACINGS

NOT FOR SALE—Yet!

Pearl Harbor and war! . . . And an urgent appeal from the Army Air Corps for a brake block capable of stopping a 30 ton bomber landing at 120 m.p.h. in 15 seconds.

Within 90 days, Raybestos' skill, experience and resource had supplied the answer to this tough problem.

Called "1492", so great was its discovery and development, this friction material is stopping bombers and super-bombers, heavy transport and fighter planes — Flying Fortresses, Liberators, Commandos, Hell-Divers, War Hawks and Thunderbolts.

Production of 5 tons of "1492" brake blocks and segments a day for the Army Air Corps is one of Raybestos' biggest war assignments and greatest achievements.

Raybestos "1492" NOT FOR SALE for civilian use because entire production is for war requirements.

"1492" will be the outstanding Heavy Duty Lining for trucks, buses and industrial equipment, — and we offer samples specially engineered to meet your post-war friction requirements.

THE RAYBESTOS DIVISION of *Raybestos-Manhattan, Inc.*, BRIDGEPORT, CONN.

FOR WAR AND ESSENTIAL CIVILIAN EQUIPMENT

Here Is Your Nearest Worthington Distributor

For Sales, Rentals and Service on BLUE BRUTE Portable Compressors, Rock Drills and Air Tools.

See full page ad 4th Cover

ALABAMA
Birmingham—Tractor & Equipment Co.
ARIZONA
Phoenix — Smith Booth Usher Company
ARKANSAS—Fort Smith — R. A. Young & Son
Little Rock — R. A. Young & Son
CALIFORNIA
Los Angeles — Smith Booth Usher Company
San Francisco—Edward F. Hale Company
COLORADO
Denver — A. J. Philpott Company
CONNECTICUT
Hartford — The Holmes-Talcott Company
GEORGIA
Atlanta — Tractor & Machinery Co., Inc.
ILLINOIS — Chicago — Kennedy-Cochran Co.
INDIANA
Indianapolis — Reid-Holcomb Company
IOWA — Des Moines — Electrical Eng. & Constr. Co.
Davenport — Industrial Engineering Equipment Co
KENTUCKY — Harlan — Hall Equipment Sales
Louisville — Williams Tractor Company
LOUISIANA
New Orleans — Wm. F. Surgi Equipment Company
MAINE — Augusta — Murray Machinery Co.
MARYLAND
Baltimore — D. C. Elphinstone, Inc.
MASSACHUSETTS
Cambridge — W. W. Field & Son, Inc.
Springfield — The Holmes-Talcott Company
MICHIGAN
Detroit — W. H. Anderson Company, Inc.
MINNESOTA
Hibbing—Arrowhead Equipment & Supply Co.
Minneapolis — The George T. Ryan Company
MISSOURI
Kansas City — Machinery & Supplies Company
St. Louis — Ryan Equipment Co.
MONTANA — Helena — Caird Engineering Works
NEW JERSEY
Hillside—P. A. Drobach
North Bergen—American Air Compressor Corp.
NEW MEXICO
Roswell — Smith Machinery Company
NEW YORK
Albany — Larkin Equipment Company
Albany—T. Southworth Tractor & Machy. Co., Inc., Menands
Binghamton — MacDougall Equipment Co.
Buffalo — Dow & Company, Inc.
Middleton — S. T. Randall, Inc.
New York—Hubbard & Floyd, Inc.
Olean — Freeborn Equipment Company
Oneonta — L. P. Butts, Inc.
Syracuse — Harrod Equipment Company
NORTH CAROLINA
Durham — Constructors Supply Company, Inc.
OHIO — Cincinnati — The Finn Equipment Company
Cleveland — Gibson-Stewart Company
Marietta — Northwest Supply & Equipment Co.
Toledo — M. W. Kilcore & Company
OKLAHOMA
Oklahoma City — Townsco Equipment Co.
OREGON
Portland — Andrews Equipment Service
PENNSYLVANIA
Easton — Sears & Bowers
Harrisburg — N. A. Coulter
Oil City — Freeborn Equipment Company
Philadelphia — Metalweld, Inc.
Pittsburgh — John McC. Latimer Company
Wilkes-Barre — Ensminger & Company
SOUTH CAROLINA
Columbia — Bell-Lott Road Machinery Co.
SOUTH DAKOTA
Sioux Falls — Empire Equipment Co.
TENNESSEE
Chattanooga — James Supply Company
Knoxville—Wilson-Weesner-Wilkinson Co.
Memphis — Tri-State Equipment Company
TEXAS — Dallas — Shaw Equipment Company
El Paso—Equipment Supply Company
Houston — Dye Welding Supply Co.
San Antonio — Patten Machinery Company
VIRGINIA
Richmond — Highway Machinery & Supply Co.
WASHINGTON
Seattle — Star Machinery Company
Spokane—Andrews Equipment Service
WEST VIRGINIA
Fairmont — Interstate Engineers & Constructors
WISCONSIN
Eau Claire — Miller, Bradford & Risberg Company
Green Bay — Nelson Machinery Company
Madison — Western Equipment Company
WYOMING
Cheyenne — Wilson Equipment & Supply Co.

Get more WORTH from air with WORTHINGTON

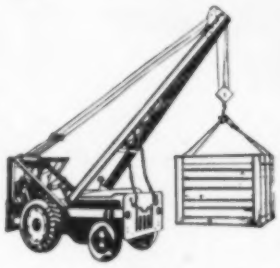
Buy Blue Brutes

Worthington Pump and Machinery Corp.

Advertisers in this issue

Adams Co., J. D. 95
Aircraft & Diesel Equip. Corp. 104
Alemite Div., Stewart-Warner Corp. 23
Allis-Chalmers Mfg. Co. 31
American Cable Division
American Chain & Cable Co., Inc. ... 3rd Cover
American Hoist & Derrick Co. 28
American Manganese Div., Amer. Brake Shoe Co. 114
Ames Baldwin Wyoming Co. 116
Armco Drainage Products Assn. 115
Armstrong Bros. Tool Co. 112
Athey Truss Wheel Co. 9
Atlas Powder Co. 50
Barber-Greene Co. 45
Barco Manufacturing Co., Not Inc. 157
Bethlehem Steel Co. 8
Blackhawk Mfg. Co. 143
Blaw-Knox Div., Blaw-Knox Co. 152, 153
Broderick & Bascom Rope Co. 159
Buckeye Traction Ditcher Co. 38
Buda Company, The 134
Bucyrus-Erie Co. 125
Butler Bin Co. 113
Byers Machine Co. 162
Calcium Chloride Association 36
Carver Pump Co., The 158
Caterpillar Tractor Co. 10
C. H. & E. Mfg. Co. 167
Chain Belt Company 101
Cleaver-Brooks Co. 48
Cleveland Tractor Co. 86, 87
Cleveland Trencher Co., The 164
Clipper Mfg. Co. 122
Clyde Iron Works, Inc. 149
Coast Metals, Inc. 122
Coffing Hoist Co. 118
Complete Machinery & Equip. Co., Inc. 166
Consolidated Steel Corp. 25
Construction Machinery Co. 103
Contractors Pump Bureau 146
Cummins Engine Co., Inc. 155
Davey Compressor Co. 47
Dixie Cup Co. 124
Dixon Valve & Coupling Co. 128
Duff-Norton Mfg. Co., The 162
Dulien Steel Pdts., Inc. 166
Electric Tamper & Equipment Co. 154
Euclid Road Machy. Co., The 7
Firestone Tire & Rubber Co., The 42
Fiske Brothers Refg. Co. (Lubriplate Div.) 141
Foote Company, Inc., The 97
Gardner-Denver Co. 107
Gar Wood Industries, Inc. 163
Gatke Corporation 124
General Excavator Co., The 43
General Motors Corp.
(Detroit Diesel Engine Div.) 32
(Truck & Coach Div.) 167
Goodrich Co., B. F. 24
Goodyear Tire & Rubber Co., The 54
Gorman-Rupp Co. 134
Griffin Equipment & Supply Co. 138
Griffin Wellpoint Corp. 103
Gulf Refining Co. 44
Haiss Mfg. Co., Inc., Geo. 166
Harnischfeger Corp. 111
Hazard Wire Rope Division,
American Chain & Cable Co., Inc. 16, 17
Heil Company, The 98, 99
Heltzel Steel Form & Iron Co. 147
Hercules Steel Products Co., The 156
Hetherington & Berner, Inc. 142
Homelite Corporation 123
Hooper & Sons Co., Wm. E. 37
Hough Co., The Frank G. 129
Huber Mfg. Co. 102
Independent Pneumatic Tool Co. 41
Ingersoll Steel & Disc. Div., Borg-Warner Corp. 140
Inland Steel Co. ..... 2nd Cover
Insley Manufacturing Corp. 136
International Harvester Co. 6
Iowa Manufacturing Co. 92, 93
Isaacson Iron Works 27
Jaeger Machine Co., The 19
Johnson Company, The C. S. 108
Koehring Company, The 121
Laclede Steel Co. 150
LaPlant-Choate Mfg. Co., Inc. 11
Laughlin Co., The Thomas 140
Lehigh Portland Cement Co. 133
LeRoi Company 100
Leschen & Sons Rope Co., A. 30
Le Tourneau, Inc., R. G. 22
Lidgerwood Mfg. Co. 138
Lima Locomotive Works, Inc. 46
Lincoln Electric Co., The 160, 161
Link-Belt Speeder Corp. 145
Lone Star Cement Corp. 5
Louisville Cement Co., Inc. 18
Lowell Wrench Co. 26
Lubriplate Div., Fiske Bros. Refining Co. 141
Lufkin Rule Co., The 94
Macwhyte Co. 165
Mall Tool Co. 126
Master Vibrator Co. 110
McGraw-Hill Book Co., Inc. 128, 144
Meili-Blumberg Corp. 110
Mercer-Robinson Co., Inc. 170
Michigan Power Shovel Co. 131
Mir-O-Col Alloy Co. 106
Moretrench Corp. 132
Morse Boulger Destructor Co. 148
National Carbide Corp. 136

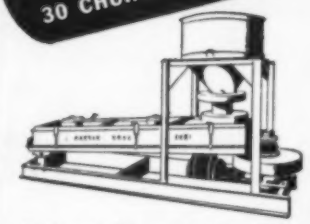
(Continued on page 167)



Tractor Cranes—Pneumatic or Solid Tires. Trailer Trucks, All Types, All Sizes. Fork Lift Trucks. Elevators, Platform and Stacking. Conveyors. Hoists. Engineered and built to requirements.

MERCER-ROBINSON COMPANY, INC.
30 CHURCH ST., NEW YORK 7, N.Y.

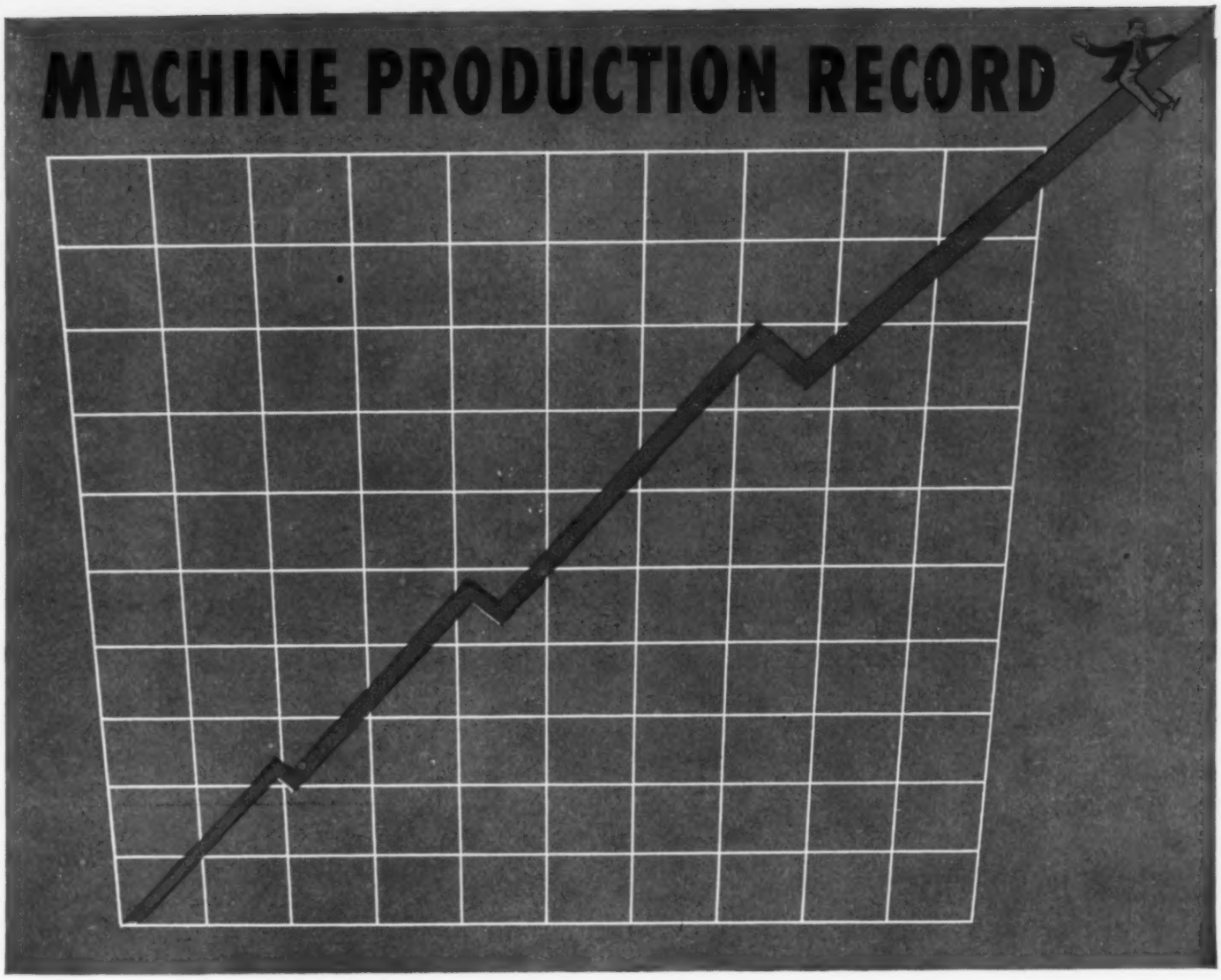
Materials HANDLING *Equipment*



Equipment for processing, liquid and dry materials, foods, chemicals, reclaimants. Individual mixers, sifters, separators, crushers, cutters, mills. Combination units. Complete systems. Standard and engineered installations.

TRADE UNIQUE MARK

Materials PROCESSING *Equipment*



JOE SWITCHED TO

TRU-LAY PREFORMED WIRE ROPE!!

(Yes — it increases machine production)

AMERICAN CABLE DIVISION

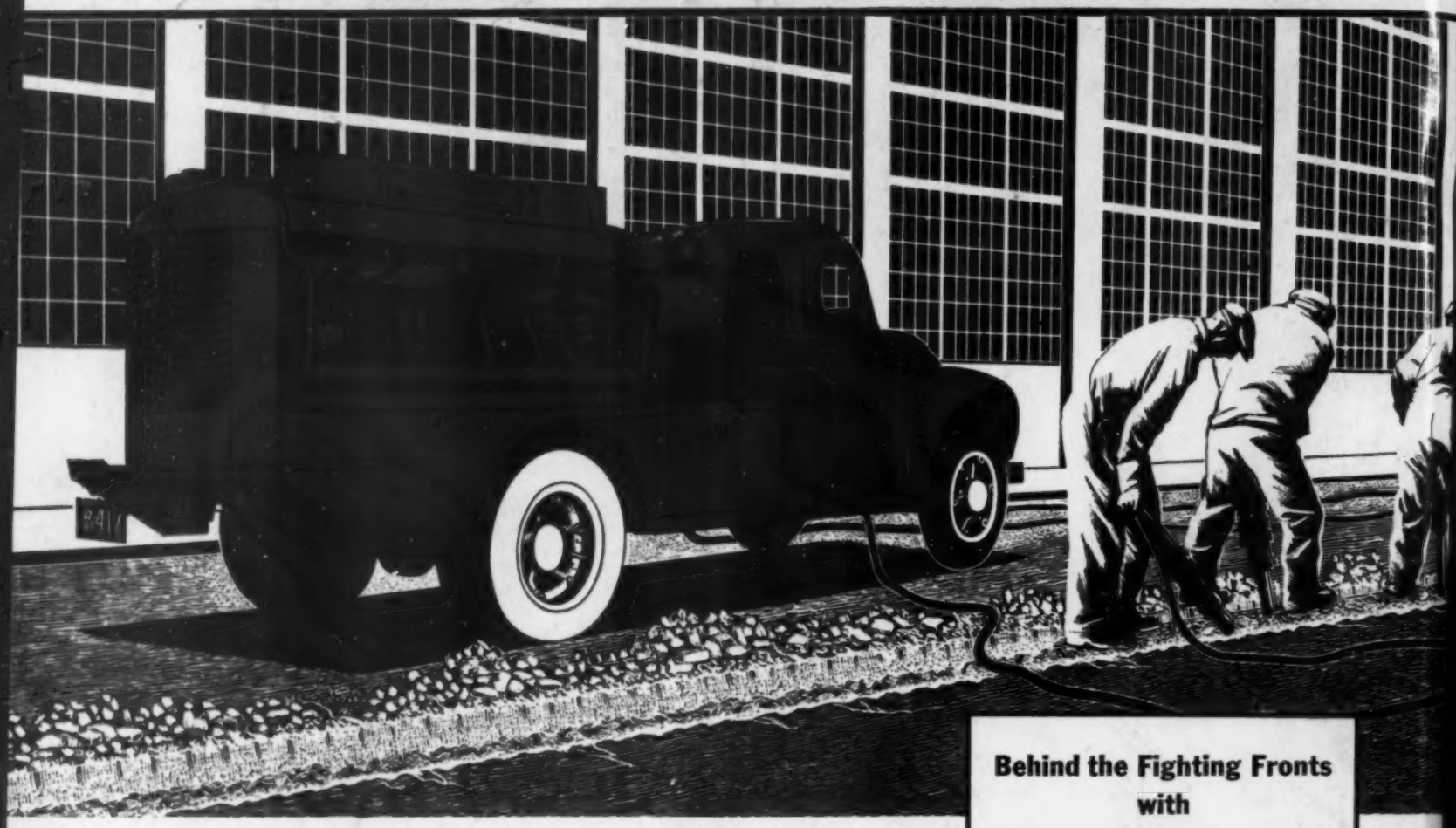
Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Tacoma

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT · CONNECTICUT

ESSENTIAL PRODUCTS...TRU-LAY Aircraft, Automotive, and Industrial Controls, TRU-LOC Aircraft Terminals, AMERICAN CABLE Wire Rope, TRU-STOP Brakes, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Castings, CAMPBELL Cutting Machines, FORD Hoists, Trolleys, HAZARD Wire Rope, MANLEY Auto Service Equipment, MARYLAND Bolts and Nuts, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Steel Castings, WRIGHT Hoists, Cranes . . . *In Business for Your Safety*

BLUE BRUTES FOR POST-WAR WATER WORKS



If you "come from Missouri" see Blue Brutes. This truck-mounted compressor will back your bid on post-war projects like this one:

> ***A 6-year betterment program outlined by the Chief Engineer and Superintendent, Kansas City Water Department, including a $2,933,000 deferred expenditure for work interrupted by the war.***

Hundreds of post-war plans are ready now, for highways, buildings, bridges, city improvement! In water works and sewerage alone, $400,000,000 to $600,000,000 is the estimated annual figure for the nation, immediately post-war. You'll find Blue Brutes your best bets to air-power the jobs.

Dependable their Feather Valves* prevent the lost-time troubles other valves are apt to cause. Blue Brute compressors deliver more air, continuously, by easier breathing.

Trouble-free—three-point suspension on chassis protects engine and compressor from misalignment due to distortion of chassis on rough going.

Economical—less maintenance time, fewer delays on the job can save big money when time is your contract's essence. This too: Worthington Blue Brute air tools use less air; modern design and easy-handling strength make them top-raters on your "air power team."

Investigate Blue Brutes, right now, for that rush job today, and that still bigger job planned for the future! Your nearest distributor is listed on page 170.

*Reg. U. S. Pat. Off.

Behind the Fighting Fronts with

BLUE BRUTES

Broken cities, like Naples, need compressed air power for reconstructing public services. Blue Brutes, in "uniforms" of olive drab, are part of Engineers' battalions overseas, part of Sea Bees' equipment, too, in battleship gray. From Arctic Circle to the tropic sands—and here at home in camps, bases, ordnance plants—Blue Brutes are with the men who now are fighting for the right to build a free America.

PC4-5

Get more WORTH from air with WORTHINGTON

BUY BLUE BRUTES

Compressors from 60 to 500 cu. ft. capacity in mount-

always set the pace for easy operation — available in

WORTH BEHIND THE NAME WORTHINGTON

Worthington Pump and Machinery Corporation Construction Equipment Division, Holyoke, Massachusetts